# Development at West Kowloon Cultural District

Monthly Environmental Monitoring and Audit (EM&A) Report

for April 2024

10 May 2024

In accordance with the Environmental Permit, Condition 3.4, this Monthly EM&A Report has been certified by the Environmental Team Leader (ETL) and verified by the Independent Environmental Checker (IEC) as complying with the requirements as set out in Sections 1, 10, 11, 12 and 13 of the EM&A Manual.

**Certified by:**

**CK WU**

Environmental Team Leader (ETL)

West Kowloon Cultural District Authority

Date 06 May 2024

**Verified by:**

**Claudine LEE**

Independent Environmental Checker (IEC)

Meinhardt Infrastructure and Environment Ltd

Date 10 May 2024

This Report Consists of:

# Part-1: EM&A at Lyric Theatre Complex

# and

# Part-2: EM&A for Foundation Works in Zone 2B & 2C

# Part-1: EM&A at Lyric Theatre Complex

MOTT MACDONALD

# Lyric Theatre Complex

Mott MacDonald
3/F International Trade Tower
348 Kwun Tong Road
Kwun Tong
Kowloon
Hong Kong

T +852 2828 5757
mottmac.hk

# Contents

## K. Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions

# Executive summary

Mott MacDonald Hong Kong Limited (MMHK) was commissioned to undertake the Environmental Team (ET) services (including environmental monitoring and audit (EM&A)) for the construction of M+ Museum Main Works (Contract No.: CC/2015/3A/022) and Lyric Theatre Complex including the Foundation Works (Contract No.: CC/2015/3A/014), L1 Contract (Contract No. CC/2017/3A/030) and L2 Contract (Contract No. CC/2017/3A/031) at West Kowloon Cultural District (WKCD) (The Project) as part of the WKCD development. The Project Proponent is the West Kowloon Cultural District Authority (WKCDA). The construction works and EM&A programme for M+ Museum was commenced on 31 October 2015 and completed on 28 February 2021; while the construction works and EM&A programme for Lyric Theatre Complex (L1 and L2 Contracts) was commenced on 1 March 2016, and the EM&A programme for L1 Contract was completed on 30 June 2021.

The overall works for the WKCD fall under two separate categories of Designated Project (DP) of the Environmental Impact Assessment Ordinance (EIAO), namely an “engineering feasibility study of urban development projects with a study area covering more than 20 ha or involving a total population of more than 100 000” (Item 1 of Schedule 3) and “an underpass more than 100m in length under the built areas” (Item A.9, Part I, Schedule 2). An Environmental Permit No. EP-453/2013/B (EP) was issued with respect to the “Underpass Road and Austin Road Flyover Serving the West Kowloon Cultural District” which specifically includes the abovementioned category of DP under Item A.9, Part I, Schedule 2 of the EIAO.

This Monthly EM&A Report presents the monitoring works at Lyric Theatre Complex (L2 Contract) from 1 April to 30 April 2024.

**Exceedance of Action and Limit Levels**

There was no breach of Action or Limit levels for Air Quality (1-hour TSP and 24-hour TSP) and Noise in this reporting month.

**Implementation of Mitigation Measures**

Construction phase weekly site inspections were carried out on 3, 10, 17, 26 and 30 April 2024 for Lyric Theatre Complex (L2 Contract) to confirm the implementation measures undertaken by the Contractor in the reporting month. The outcomes are presented in Section 4 and the status of implementation of mitigation measures in the site is shown in **Appendix J**.

Landscape and visual impact inspections were conducted as part of the abovementioned weekly site inspection during the reporting month. No adverse comment on landscape and visual aspects were made during the inspections.

**Record of Complaints**

No environmental complaint was recorded in the reporting month.

**Record of Notifications of Summons and Successful Prosecutions**

No notifications of summons and successful prosecutions were recorded in the reporting month.

**Future Key Issues**

The major site works for L2 to be commissioned in the coming month include:

- LTC construction

  Structure (Slab, wall, columns and beam)
  - Falsework and formwork erection
  - Reinforcement work
  - Concrete work

  ABWF & MEP work

  Façade work
- ASDA and Lyric Theatre Promenade
  - Structure and MEP works
  - Construction of FTNS draw pit and ducting
  - CLP cabling work at Austin Road
- DCS cofferdam (Cofferdam B)
  - Backfilling
  - Construction of thrust block for DCS pipes
  - Excavation work for drainage work and UU services
- Extended basement
  - ABWF & MEP works
- Underpass and Associated Area
  - Structure works
  - ABWF & MEP works

Potential environmental impacts due to the construction activities, including air quality, noise, water quality, waste, landscape and visual, will be monitored or reviewed. The recommended environmental mitigation measures shall be implemented on site and regular inspections as required will be carried out to ensure that the environmental conditions are acceptable.

# 1 Introduction

## 1.1 Background

Mott MacDonald Hong Kong Limited (MMHK) was commissioned to undertake the Environmental Team (ET) services (including environmental monitoring and audit (EM&A)) for the construction of M+ Museum Main Works (Contract No.: CC/2015/3A/022) and Lyric Theatre Complex including the Foundation Works (Contract No.: CC/2015/3A/014), L1 Contract (Contract No. CC/2017/3A/030) and L2 Contract (Contract No. CC/2017/3A/031) at West Kowloon Cultural District (WKCD) (The Project) as part of the WKCD development. The Project Proponent is the West Kowloon Cultural District Authority (WKCDA). The construction works and EM&A programme for M+ Museum was commenced on 31 October 2015 and completed on 28 February 2021; while the construction works and EM&A programme for Lyric Theatre Complex (L1 and L2 Contracts) were commenced on 1 March 2016, and the EM&A programme for L1 Contract was completed on 30 June 2021.

The overall works for the WKCD fall under two separate categories of Designated Project (DP) of the Environmental Impact Assessment Ordinance (EIAO), namely an “engineering feasibility study of urban development projects with a study area covering more than 20 ha or involving a total population of more than 100 000” (Item 1 of Schedule 3) and “an underpass more than 100m in length under the built areas” (Item A.9, Part I, Schedule 2). An Environmental Permit No. EP-453/2013/B (EP) was issued with respect to the “Underpass Road and Austin Road Flyover Serving the West Kowloon Cultural District” which specifically includes the abovementioned category of DP under Item A.9, Part I, Schedule 2 of the EIAO. The captioned projects include part of the abovementioned underpass road located within the site boundary also falls under this same category.

The M+ Museum development aims to provide an iconic presence for the M+ Museum, semi-transparent vertical plane, housing education facilities, a public restaurant and museum offices. At ground and lower levels, generous access will be provided to the park and other West Kowloon Cultural District facilities, alongside a public resource centre, theatres, retail and dining, and back-of-house functions.

The 1,200-seat Lyric Theatre Complex will be Hong Kong’s first world-class facility for dance performances, including ballet, contemporary and Chinese dance forms. In the run up to the opening of further major performing arts venues in the WKCD, it will also be used for a wide variety of performing arts events including drama, opera and musical performances. The Lyric Theatre Complex will act as a platform for Hong Kong’s leading arts organisations and be a new major venue to show programmes from Asia and worldwide.

The Monthly EM&A Report is prepared in accordance with the Condition 3.4 of the Environmental Permit No. EP-453/2013/B. This Monthly EM&A Report presents the monitoring works at Lyric Theatre Complex (L2 Contract) from 1 April to 30 April 2024. The purpose of this report is to summarise the findings in the EM&A of the project over the reporting period.

## 1.2 Project Organisation

The organisation chart and lines of communication with respect to the on-site environmental management structure together with the contact information of the key personnel are shown in **Appendix A**.

## 1.3 Status of Construction Works in the Reporting Period

During the reporting period, construction works at L2 undertaken include:

- LTC construction

  Structure (Slab, wall, columns and beam)
  - Falsework and formwork erection
  - Reinforcement work
  - Concrete work

  ABWF & MEP work

  Façade work
- ASDA and Lyric Theatre Promenade
  - Structure, ABWF and MEP works
  - Granite installation for planter at digital signage
  - Construction of FTNS draw pit and ducting
- DCS cofferdam (Cofferdam B)
  - Backfilling
  - Dismantle ELS struts
  - Construction of thrust block for DCS pipes
  - Construction of valve chamber
- Extended basement
  - ABWF & MEP works
- Underpass and Associated Area
  - Structure works
  - ABWF & MEP works

The Construction Works Programme of Lyric Theatre Complex (L2 Contract) is provided in **Appendix B**. As on 31 January 2023, site area P32 was handed over to Sun Hung Kai Properties and was thus excluded from the site boundary of Lyric Theatre Complex (L2 Contract), the area was delineated in red in the layout plan of the Project which is provided in **Figure 1**. Please refer to **Table 4.1** on the status of the environmental licenses.

## 1.4 Summary of EM&A Requirements and Alternative Monitoring Locations

The EM&A programme requires environmental monitoring of air quality, noise, landscape and visual as specified in the approved EM&A Manual.

### 1.4.1 EM&A Requirements

A summary of impact EM&A requirements is presented in **Table 1.1**.

**Table 1.1: Summary of Impact EM&A Requirements**

| Parameters | Descriptions | Locations | Frequencies |
|---|---|---|---|
| Air Quality | 24-Hour TSP | AM1 – International Commerce Centre | At least once every 6 days |

| Parameters | Descriptions | Locations | Frequencies |
|---|---|---|---|
| | 1-Hour TSP | AM1 – International Commerce Centre | At least 3 times every 6 days |
| | 24-Hour TSP | AM2 – The Harbourside Tower 1 | At least once every 6 days |
| | 1-Hour TSP | AM2 – The Harbourside Tower 1 | At least 3 times every 6 days |
| Noise | Leq, 30 minutes | NM1- The Harbourside Tower 1 | Weekly |
| Landscape & Visual | Monitor implementation of proposed mitigation measures during the construction stage | As described in Table 9.1 and 9.2 of the EM&A Manual | Bi-weekly |

### 1.4.2 Alternative Monitoring Locations

In the context of the monitoring activities at M+ Museum and the Lyric Theatre Complex, three monitoring stations had been considered, including AM1 (International Commerce Centre), AM2 (The Harbourside Tower 1) for air monitoring, and NM1 (The Harbourside Tower 1) for noise monitoring. Other monitoring locations (i.e. AM3 to AM5 and NM2 to NM5) were so far away from M+ Museum and the Lyric Complex and could not be representative for impact monitoring.

The Harbourside management office formally rejected our proposal of setting up air quality and noise monitoring equipment on its premises at the podium level of Tower 1 (AM2/NM1) on 10 November 2015. Nevertheless, a suitable air quality monitoring location at AM2 was identified on the ground floor in front of The Harbourside Tower 1, which is at the same location as that of baseline monitoring for consistency. No management approval is required on the ground floor for conducting the air monitoring. However, the electricity supply at AM2 was suspended from 31 August 2016. In order to have a more secure electricity supply, an alternative air monitoring location (AM2A) was identified at Austin Road West opposite to The Harbourside Tower 1, which is close to Lyric Theatre Complex site entrance. This alternative air monitoring location was approved by EPD on 28 September 2016. Due to the works programme, the air monitoring location AM2A has been relocated to the alternative monitoring location AM2B at the 1$^{st}$ floor of Gammon's site office, which was approved by EPD on 21 February 2019. In view of the upcoming construction works to be undertaken at the air monitoring station AM2B, AM2B was no longer available for conducting the impact air quality monitoring. Hence, an alternative air monitoring location was identified on the ground floor in front of The Harbourside Tower 1 (AM2) which is at the same location as the baseline monitoring and this previously approved monitoring location had also been used for the EM&A Programme from November 2015 to August 2016, the relocation was approved by EPD on 27 May 2021.

Alternative noise monitoring location was identified at The Arch (NM2); however, The Arch management office formally rejected our proposal of setting up noise monitoring equipment on its premises on 23 November 2015. On the other hand, noise monitoring at G/F of Harbourside could not be representative. However, approval from the management office of the International Commerce Centre has been granted on 29 February 2016 for conducting noise monitoring at the alternative noise monitoring location identified at the podium floor (NM1A) which is free from screening to the construction activities.

In short, 2 air quality monitoring stations and 1 noise impact monitoring station were confirmed for the impact monitoring.

The Environmental Quality Performance Limits for air quality and noise are shown in **Appendix C**.

The Event and Action Plan for air quality, construction noise, and landscape and visual are shown in **Appendix D**.

The EM&A programme followed the recommended mitigation measures in the EM&A Manual. The EM&A requirements as well as the summary of implementation status of the environmental mitigation measures are provided in **Appendix J**.

# 2 Impact Monitoring Methodology

## 2.1 Introduction

For air quality and noise, the monitoring methodology, including the monitoring locations, monitoring equipment used, monitoring parameters, and frequency and duration etc., for air quality and noise are detailed in this Section. The environmental monitoring schedules for the reporting period and the tentative monitoring schedule for the coming month are provided in **Appendix E**.

For landscape and visual impact, the relevant EM&A monitoring requirements and details are also presented in this Section.

## 2.2 Air Quality

### 2.2.1 Monitoring Parameters, Frequency and Duration

**Table 2.1** summarizes the monitoring parameters, frequency and duration of the TSP monitoring.

**Table 2.1: Air Quality Monitoring Parameters, Frequency and Duration**

| Parameter | Frequency | Duration |
|---|---|---|
| 24-hour TSP | At least once in every six-days | 24 hours |
| 1-hour TSP | At least 3 times every six-days | 60 minutes |

### 2.2.2 Monitoring Locations

Currently, the works under the captioned project are confined in the western part of the WKCD site. Therefore, only the monitoring stations AM1 and AM2 were set up at the proposed locations in accordance with updated EM&A Manual. Location of the monitoring station is given in **Table 2.2** and shown in **Figure 1**.

**Table 2.2: Air Quality Monitoring Station**

| Monitoring Station | Location |
|---|---|
| AM1 | International Commerce Centre (ICC) |
| AM2 | The Harbourside Tower 1 – Ground Floor |

### 2.2.3 Monitoring Equipment

For 24-hour TSP air quality monitoring, High Volume Sampler (HVS) was used at air monitoring station AM1 and portable direct reading dust meter was used at air monitoring station AM2 due to the unavailability of power supply for HVS at / in the vicinity of the AM2. The portable direct reading dust meter is capable of producing comparable results as that by the HVS method. For 1-hour TSP monitoring, portable direct reading dust meter was used for the measurement.

**Table 2.3** summarizes the equipment used in the impact air quality monitoring. Copies of the calibration certificates for the calibration kit and portable dust meters are attached in **Appendix F**.

**Table 2.3: TSP Monitoring Equipment**

| Equipment | Model |
|---|---|
| **24-hour TSP monitoring** | |
| High Volume Sampler | TE-5170 (Serial No: 0767) |
| Calibrator | TE-5025A (Orifice I.D.: 2454) |
| Portable direct reading dust meter | Sibata LD-5R (Serial No.: 841724) |
| **1-hour TSP monitoring** | |
| Portable direct reading dust meter | Sibata LD-3B (Serial No.: 456668 and 235780) |

Calibration of the HVS (five point calibration) using Calibration Kit was carried out every two months. The HVS calibration orifice will be calibrated annually. Calibration certificate of the TE-5025A Calibration Kit and the HVS are provided in **Appendix F**.

The portable direct reading dust meter should be determined periodically (e.g. annually) by the HVS to check the validity and accuracy of the results measured by direct reading method.

### 2.2.4 Monitoring Methodology

**24-hour TSP Monitoring (HVS)**

**Installation**

The HVS was installed at the site boundary. The following criteria were considered in the installation of the HVS.

- A horizontal platform with appropriate support to secure the sampler against gusty wind was provided.
- The distance between the HVS and any obstacles, such as buildings, was at least twice the height that the obstacle protrudes above the HVS.
- A minimum of 2 metres separation from walls, parapets and penthouse was required for rooftop sampler.
- A minimum of 2 metres separation from any supporting structure, measured horizontally was required.
- No furnace or incinerator flues or building vent were nearby.
- Airflow around the sampler was unrestricted.
- The sampler has been more than 20 metres from any drip line.
- Permission was obtained to set up the sampler and to obtain access to the monitoring station.
- A secured supply of electricity is needed to operate the sampler.

**Preparation of Filter Papers**

- Glass fibre filters were labelled and sufficient filters that were clean and without pinholes were selected.
- The filters used are specified to have a minimum collection efficiency of 99 percent for 0.3 μm (DOP) particles.
- All filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than ±3 °C with relative humidity (RH) < 50% and was not variable by more than ±5 %. A convenient working RH was 40%. All preparation of filters was done by Hong Kong Laboratory Accreditation Scheme (HOKLAS) accredited laboratory.

### Field Monitoring Procedures

- The power supply was checked to ensure the HVS works properly.
- The filter holder and the area surrounding the filter were cleaned.
- The filter holder was removed by loosening the four bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully.
- The filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter.
- The swing bolts were fastened to hold the filter holder down to the frame. The pressure applied should be sufficient to avoid air leakage at the edges.
- The shelter lid was closed and was secured with the aluminium strip.
- The HVS was warmed-up for about 5 minutes to establish run-temperature conditions.
- A new flow rate record sheet was set into the flow recorder.
- The flow rate of the HVS was checked and adjusted at around 1.3 $m^3$/min. The range specified in the EM&A Manual was between 0.6-1.7 $m^3$/min.
- The programmable timer was set for a sampling period of 24 hours, and the starting time, weather condition and the filter number were recorded.
- The initial elapsed time was recorded.
- At the end of sampling, the sampled filter was removed carefully and folded in half length so that only surfaces with collected particulate matter were in contact.
- It was then placed in a clean plastic envelope and sealed.
- All monitoring information was recorded on a standard data sheet.
- Filters were sent to a Hong Kong Laboratory Accreditation Scheme (HOKLAS) accredited laboratory for analysis.

### Maintenance and Calibration

- The HVS and its accessories are maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply.
- HVSs were calibrated upon installation and thereafter at bi-monthly intervals. The calibration kits were calibrated annually.

### Weather Condition

- Meteorological data extracted from Hong Kong Observatory for the reporting month is provided in **Appendix H**.

## 24-hour TSP Monitoring (Portable direct reading dust meter)

### Field Monitoring

The measuring procedures of the portable direct reading dust meter are in accordance with the Manufacturer's Instruction Manual as follows:

- Turn the power on.
- Close the air collecting opening cover.
- Push the "TIME SETTING" switch to [BG].
- Push "START/STOP" switch to perform background measurement for 6 seconds.
- Turn the knob at SENSI ADJ position to insert the light scattering plate.
- Leave the equipment for 1 minute upon "SPAN CHECK" is indicated in the display.

- Push “START/STOP” switch to perform automatic sensitivity adjustment. This measurement takes 1 minute.
- Pull out the knob and return it to MEASURE position.
- Setting time period of 24 hours for the 24-hour TSP measurement.
- Push “START/STOP” to start the 24-hour TSP measurement.
- Regular checking of the time period setting to ensure monitoring time of 24 hours.

**Maintenance and Calibration**

- The portable direct reading dust meter would be checked at 3-month intervals and calibrated at 1-year intervals throughout all stages of the air quality monitoring.
- Calibration records for direct dust meters are shown in **Appendix F**.

**Weather Condition**

- Meteorological data extracted from Hong Kong Observatory for the reporting month is provided in **Appendix H**.

**1-hour TSP Monitoring**

**Field Monitoring**

The measuring procedures of the 1-hour dust meter are in accordance with the Manufacturer’s Instruction Manual as follows:

- Turn the power on.
- Close the air collecting opening cover.
- Push the “TIME SETTING” switch to [BG].
- Push “START/STOP” switch to perform background measurement for 6 seconds.
- Turn the knob at SENSI ADJ position to insert the light scattering plate.
- Leave the equipment for 1 minute upon “SPAN CHECK” is indicated in the display.
- Push “START/STOP” switch to perform automatic sensitivity adjustment. This measurement takes 1 minute.
- Pull out the knob and return it to MEASURE position.
- Setting time period of 1 hour for the 1-hour TSP measurement.
- Push “START/STOP” to start the 1-hour TSP measurement.
- Regular checking of the time period setting to ensure monitoring time of 1 hour.

**Maintenance and Calibration**

- The 1-hour dust meter would be checked at 3-month intervals and calibrated at 1-year intervals throughout all stages of the air quality monitoring.
- Calibration records for direct dust meters are shown in **Appendix F**.

**Weather Condition**

- Meteorological data extracted from Hong Kong Observatory for the reporting month is provided in **Appendix H**.

## 2.3 Noise

### 2.3.1 Monitoring Parameters, Frequency and Duration

**Table 2.4** summarizes the monitoring parameters, frequency and duration of noise monitoring. The noise in A-weighted levels $L_{eq}$, $L_{10}$ and $L_{90}$ are recorded in a 30-minute interval between 0700 and 1900 hours.

**Table 2.4: Noise Monitoring Parameters, Period and Frequency**

| Time Period | Parameters | Frequency |
|---|---|---|
| Daytime on normal weekdays (0700-1900 hours) | $L_{eq}$(30 min), $L_{90}$(30 min) & $L_{10}$ (30 min) | Once every week |

### 2.3.2 Monitoring Location

Currently, the works under the captioned project are confined in the western part of the WKCD site. Therefore, only the monitoring station NM1A was set up. Location of the monitoring station is given in **Table 2.5** and shown in **Figure 1**.

**Table 2.5: Noise Monitoring Station**

| Monitoring Station | Location |
|---|---|
| NM1A | International Commerce Centre (ICC) |

### 2.3.3 Monitoring Equipment

Integrating Sound Level Meter was used for noise monitoring. It was a Type 1 sound level meter capable of giving a continuous readout of the noise level readings including equivalent continuous sound pressure level ($L_{Aeq}$) and percentile sound pressure level ($L_x$). They comply with International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1). **Table 2.6** summarizes the noise monitoring equipment model being used.

**Table 2.6: Noise Monitoring Equipment**

| Monitoring Station | Equipment Model | |
|---|---|---|
| | Integrating Sound Level Meter | Calibrator |
| NM1A | Rion NL-52 (Serial No. 00131627) | LARSON DAVIS CAL200 (Serial No. 11333) |

### 2.3.4 Monitoring Methodology

**Field Monitoring**

- The microphone of the Sound Level Meter was set at least 1.2 m above the ground.
- Free Field measurement was made at the monitoring locations.
- The battery condition was checked to ensure the correct functioning of the meter.
- Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:
  - frequency weighting: A
  - time weighting: Fast
  - time measurement: 30 minutes intervals (between 0700-1900 on normal weekdays)
- Prior to and after each noise measurement, the meter was calibrated using a Calibrator for 94 dB at 1 kHz. If the difference in the calibration level before and after measurement

was more than 1 dB, the measurement would be considered invalid and has to be repeated after re-calibration or repair of the equipment.
- During the monitoring period, the $L_{eq}$, $L_{10}$ and $L_{90}$ were recorded. In addition, any site observations and noise sources were recorded on a standard record sheet.
- A correction of +3dB(A) was made to the free field measurements.

**Maintenance and Calibration**

- The microphone head of the sound level meter and calibrator is cleaned with soft cloth at quarterly intervals.
- The sound level meter and calibrator are sent to the supplier or HOKLAS laboratory to check and calibrate at yearly intervals.
- Calibration records are shown in **Appendix F**.

**Weather Condition**

- Meteorological data extracted from Hong Kong Observatory for the reporting month is provided in **Appendix H**.

## 2.4 Landscape and Visual

### 2.4.1 Monitoring Program

**Table 2.7** details the monitoring program (as proposed in the WKCD EIA report) for landscape and visual impact during the construction phase.

**Table 2.7: Monitoring Program for Landscape and Visual Impact during Construction Phase**

| Stage | Monitoring Task | Frequency | Report | Approval |
|---|---|---|---|---|
| Construction | Monitor implementation of proposed mitigation measures during the construction stage. | Bi-weekly | ET to report on Contractor's compliance | Counter-signed by IEC |

During the landscape and visual impact monitoring, any changes in relation to the landscape and visual amenity should be monitored with reference to the baseline conditions of the site. In addition, mitigation measures were proposed in the WKCD EIA report to minimise the landscape and visual impacts during the construction phase. The proposed mitigation measures as shown in Table 9.1 and Table 9.2 of the EM&A Manual should be checked for proper implementation.

# 3 Monitoring Results

## 3.1 Impact Monitoring

Construction impact monitoring for air quality, noise and landscape and visual impact was undertaken in compliance with the EM&A Manual during the reporting month.

## 3.2 Air Quality Monitoring

### 3.2.1 1-hour TSP

Results of 1-hour TSP at the monitoring location AM1 and AM2 are summarised in **Table 3.1**. Graphical plots of the monitoring results are shown in **Appendix G**.

**Table 3.1: Summary of 1-hour TSP monitoring results**

| Monitoring Station | Monitoring Date | Start Time | 1-hour TSP (µg/m3) | | | Range (µg/m3) | Action Level (µg/m3) | Limit Level (µg/m3) |
|---|---|---|---|---|---|---|---|---|
| | | | 1st Result | 2nd Result | 3rd Result | | | |
| AM1 | 3-Apr-24 | 8:23 | 39 | 45 | 48 | 21-48 | 273.7 | 500 |
| | 9-Apr-24 | 8:24 | 25 | 27 | 30 | | | |
| | 15-Apr-24 | 8:28 | 29 | 33 | 35 | | | |
| | 20-Apr-24 | 8:24 | 24 | 21 | 25 | | | |
| | 26-Apr-24 | 8:13 | 31 | 25 | 28 | | | |
| AM2 | 3-Apr-24 | 8:38 | 54 | 50 | 55 | 35-55 | 274.2 | 500 |
| | 9-Apr-24 | 8:39 | 40 | 36 | 39 | | | |
| | 15-Apr-24 | 8:43 | 44 | 39 | 47 | | | |
| | 20-Apr-24 | 8:39 | 40 | 35 | 36 | | | |
| | 26-Apr-24 | 8:28 | 40 | 36 | 39 | | | |

### 3.2.2 24-hour TSP

Results of 24-hour TSP at the monitoring location AM1 and AM2 are summarised in **Table 3.2**. Graphical plots of the monitoring results are shown in **Appendix G**.

**Table 3.2: Summary of 24-hour TSP monitoring results**

| Monitoring Station | Monitoring Date | Start Time | Monitoring Results (µg/m$^3$) | Range (µg/m$^3$) | Action Level (µg/m$^3$) | Limit Level (µg/m$^3$) |
|---|---|---|---|---|---|---|
| AM1 | 3-Apr-24 | 8:21 | 31 | 19-31 | 143.6 | 260 |
| | 9-Apr-24 | 8:21 | 21 | | | |
| | 15-Apr-24 | 8:25 | 24 | | | |
| | 20-Apr-24 | 8:21 | 19 | | | |
| | 26-Apr-24 | 8:10 | 27 | | | |
| AM2 | 3-Apr-24 | 8:35 | 38 | 24-39 | 151.1 | 260 |
| | 9-Apr-24 | 8:36 | 28 | | | |
| | 15-Apr-24 | 8:40 | 39 | | | |
| | 20-Apr-24 | 8:36 | 24 | | | |
| | 26-Apr-24 | 8:25 | 34 | | | |

No exceedance of 1-hour and 24-hour TSP (Action or Limit Level) was recorded in the reporting period.

## 3.3 Noise Monitoring

The construction noise monitoring results at the monitoring location NM1A are summarized in **Table 3.3**. Graphical plots of the monitoring data and the station set-up of a free-field measurement are shown in **Appendix G**.

**Table 3.3: Summary of noise monitoring results during normal weekdays**

| Monitoring Date | Start Time | End Time | $L_{eq}$ (30 mins)*, dB(A) | Limit Level for $L_{eq}$ (dB(A)) |
|---|---|---|---|---|
| 3-Apr-24 | 9:21 | 9:51 | 65 | 75 |
| 9-Apr-24 | 9:22 | 9:52 | 65 | |
| 15-Apr-24 | 9:27 | 9:57 | 65 | |
| 26-Apr-24 | 9:11 | 9:41 | 64 | |

Remarks:
* +3dB (A) correction was applied to free-field measurement.

No exceedance (Action/Limit Level) of construction noise was recorded in the reporting month.

## 3.4 Landscape and Visual Impact

Landscape and visual impact inspections were conducted as part of the weekly site inspection on 3 and 17 April 2024 for Lyric Theatre Complex (L2 Contract) during the reporting month. As reviewed by the registered Landscape Architect, no adverse comment on landscape and visual aspects was made during this inspection.

The landscape and visual mitigation measures were implemented during the reporting period. The summary of implementation status of the environmental mitigation measures is provided in **Appendix J**.

# 4 Site Environmental Management

## 4.1 Site Inspection

Construction phase weekly site inspections were carried out on 3, 10, 17, 26 and 30 April 2024 at Lyric Theatre Complex (L2 Contract). While the site environmental management committee meeting with IEC, ET, ER and Contractor was held on 17 April 2024. All observations have been recorded in the site inspection checklist and passed to the Contractor together with the appropriate recommended mitigation measures where necessary.

The key observations from the site inspections and associated recommendations are summarized in **Table 4.1.**

**Table 4.1: Summary of Site Inspections and Recommendations for L2**

| Inspection Date | Parameter | Observation / Recommendation | Contactor's Responses / Action(s) Undertaken | Close-out (Date) |
|---|---|---|---|---|
| 3/4/2024 | Waste Management | Waste was observed idle on ground without proper storage, the contractor was reminded to remove the waste regularly. | The contractor has removed the waste. | 9/4/2024 |
| 3/4/2024 | Waste Management | General refuse was observed without proper storage, the contractor was reminded to clear the waste regularly and ensure proper storage of general refuse. | The contractor has cleared the waste and will ensure proper storage of general refuse. | 9/4/2024 |
| 10/4/2024 | Air Quality | Fugitive dust was observed during breaking, the contractor was reminded to maintain active water spraying during works that may give rise to fugitive dust. | The breaking works were conducted for a short period of time and the breaker was removed subsequently, the contractor was reminded to adopt proper noise and dust mitigation measures should such works be required. | 10/4/2024 |
| 10/4/2024 | Noise | The contractor was reminded to properly lap the noise insulating fabric to avoid noise impact. | The breaking works were conducted for a short period of time and the breaker was removed subsequently, the contractor was reminded to adopt proper noise and dust mitigation measures should such works be required. | 10/4/2024 |
| 10/4/2024 | Water Quality | The contractor was reminded to provide a suitable drip tray for the breaker head. | The contractor has provided a drip tray for the breaker head. | 17/4/2024 |
| 17/4/2024 | Water Quality | The water was observed turbid and grey in colour, the contractor was reminded to ensure the wastewater treatment facility is functioning properly. | The contractor has ensured the proper functioning of wastewater treatment facility. | 19/4/2024 |

| | | | | |
|---|---|---|---|---|
| 17/4/2024 | Water Quality | Chemicals were observed without drip tray, the contractor was reminded to provide a suitable drip tray or remove the chemicals if no longer in use. | The contractor has removed the chemicals. | 23/4/2024 |
| 26/4/2024 | Air Quality | Fugitive dust impact was observed, the contractor was reminded to implement proper dust mitigation measures when undertaking works. | The works were ended shortly afterwards, the contractor was thus reminded to implement proper dust mitigation measures when undertaking works. | 26/4/2024 |
| 26/4/2024 | Noise | Broken noise insulating fabric was observed, the contractor was reminded to replace with a proper noise insulating fabric. | The contractor has replaced with a proper noise insulating fabric for the breaker. | 26/4/2024 |
| 30/4/2024 | Air Quality | Insufficient dust suppression measures were implemented during breaking works, the contractor was reminded to increase water spraying frequency to avoid fugitive dust impact. | The contractor has increased water spraying frequency to avoid dust impact. | 2/5/2024 |
| 30/4/2024 | Noise | A proper noise insulating fabric should be provided for the breaker. | The contractor has replaced with a proper noise insulating fabric for the breaker. | 2/5/2024 |

## 4.2 Advice on the Solid and Liquid Waste Management Status

The Contractor has been registered as a chemical waste producer for the Project. Construction and demolition (C&D) material sorting will be carried out on site. A sufficient number of receptacles were available for general refuse collection.

As advised by the Lyric Theatre Complex (L2 Contract) Contractor, 235.4 tonnes, 48.0 tonnes and 0.0 tonne of inert C&D materials were disposed of as public fill to Tseung Kwan O Area 137 Public Fill, Tuen Mun Area 38 Public Fill and Chai Wan Public Fill Barging Point respectively in the reporting month, while 467.1 tonnes of general refuse were disposed of at SENT and WENT landfill. 0.0 tonne of metals, 0.0 tonne of paper/cardboard packaging, 0.0 tonne of plastics and 0.0 tonne of timber were collected by recycling contractors in the reporting month. 0.0 tonne of inert C&D material was reused on site. 0.0 tonne of inert C&D material was reused in other projects and 0.0 tonne of inert C&D material was imported for reuse at site. 0.0 tonne of inert C&D material was disposed to sorting facility and 0.0 tonne of chemical waste were collected by licensed contractors in the reporting period.

The actual amounts of different types of waste generated by the activities of construction works at Lyric Theatre Complex in the reporting month are shown in **Appendix I**.

## 4.3 Status of Environmental Licenses and Permits

The environmental permits, licenses, and/or notifications on environmental protection for this Project which were valid during the period are summarised in **Table 4.2**.

**Table 4.2: Status of Environmental Submissions, Licenses and Permits for L2**

| Permit / License No. / Notification / Reference No. | Valid Period | | Status | Remarks |
|---|---|---|---|---|
| | From | To | | |
| **Chemical Waste Producer Registration** | | | | |
| WPN:5213-217-G2347-39 | 13-Sep-21 | - | Valid | |
| **Billing Account Construction Waste Disposal** | | | | |
| 7032787 | 02-Jan-19 | - | Account Active | |
| **Construction Noise Permit** | | | | |
| GW-RE1395-23 | 25-Nov-23 | 24-May-24 | Valid | |
| **Wastewater Discharge License** | | | | |
| WT00043449-2023 | 30-Mar-23 | 30-Apr-28 | Valid | |
| **Notification under Air Pollution Control (Construction Dust) Regulation** | | | | |
| 448474 | 27-Aug-19 | - | Notified | |

## 4.4 Recommended Mitigation Measures

The EM&A programme followed the recommended mitigation measures in the EM&A Manual. The EM&A requirements as well as the summary of implementation status of the environmental mitigation measures are provided in **Appendix J**. In particular, the following mitigation measures were brought to attention during the site inspections:

**Air Quality**

- Water spraying for active construction areas should be undertaken.
- Maintain in high standard of housekeeping to prevent emission of fugitive dust.

**Noise**

- Noise insulating fabric should be adopted for the PME.

**Water Quality**

- Oils and fuels should be stored in designated areas which have pollution prevention facilities.
- All drainage facilities should be maintained to ensure proper and efficient operation at all times and particularly during rainstorms.

**Waste Management**

- All waste generated at site should be collected and disposed to an appropriate facility regularly.
- General refuse should be sorted in enclosed bins or compaction units separated from inert C&D materials.

# 5 Compliance with Environmental Permit

The status of the required submission under the EP during the reporting period is summarized in **Table 5.1**.

**Table 5.1: Status of Submissions under the Environmental Permit**

| EP Condition | Submission | Submission Date |
|---|---|---|
| Condition 3.4 | Monthly EM&A Report for March 2024 | 12 April 2024 |

# 6 Report in Non-compliance, Complaints, Notification of Summons and Successful Prosecutions

## 6.1 Record on Non-compliance of Action and Limit Levels

There was no breach of Action or Limit Levels for Air Quality and Noise monitoring in the reporting month.

## 6.2 Record on Environmental Complaints Received

No environmental complaint was received in the reporting month.

The cumulative statistics on complaints were provided in **Appendix K**.

## 6.3 Record on Notifications of Summons and Successful Prosecution

No notifications of summons or successful prosecutions were received this month. The cumulative statistics on notifications of summons and successful prosecutions were provided in **Appendix K**.

# 7 Future Key Issues

## 7.1 Construction Works for the Coming Month(s)

The major site works for L2 to be commissioned in the coming month include:

- LTC construction

  Structure (Slab, wall, columns and beam)
  - Falsework and formwork erection
  - Reinforcement work
  - Concrete work

  ABWF & MEP work

  Façade work
- ASDA and Lyric Theatre Promenade
  - Structure and MEP works
  - Construction of FTNS draw pit and ducting
  - CLP cabling work at Austin Road
- DCS cofferdam (Cofferdam B)
  - Backfilling
  - Construction of thrust block for DCS pipes
  - Excavation work for drainage work and UU services
- Extended basement
  - ABWF & MEP works
- Underpass and Associated Area
  - Structure works
  - ABWF & MEP works

## 7.2 Key Issues for the Coming Month

Key issues to be considered at Lyric Theatre Complex in the coming month include:

- Generation of dust from construction works;
- Noise impact from operating equipment and machinery on-site;
- Generation of site surface runoffs and wastewater from activities on-site;
- Management of stockpiles and slopes, particularly on rainy days;
- Sorting, recycling, storage and disposal of general refuse and construction waste;
- Management of chemicals and avoidance of oil spillage on-site; and
- Operating conditions of drainage facilities.

## 7.3 Monitoring Schedule for the Coming Month

The environmental site inspection and environmental monitoring will be continued in the coming month. The tentative monitoring schedule for the coming month is shown in the **Appendix E**.

# 8 Conclusions and Recommendations

## 8.1 Conclusions

The EM&A programme as recommended in the EM&A Manual has been undertaken. The construction works and EM&A programme for M+ Museum was commenced on 31 October 2015 and completed on 28 February 2021; while the construction works and EM&A programme for Lyric Theatre Complex (L1 and L2 Contracts) was commenced on 1 March 2016, and the EM&A programme for L1 Contract was completed on 30 June 2021.

Monitoring of air quality and noise with respect to the Project is underway. In particular, the 1-hour TSP, 24-hour TSP, noise level (as $L_{eq}$, 30 minutes) under monitoring have been checked against established Action and Limit levels. There was no breach of Action and Limit Levels for 1-hour TSP, 24-hour TSP and noise in the reporting month.

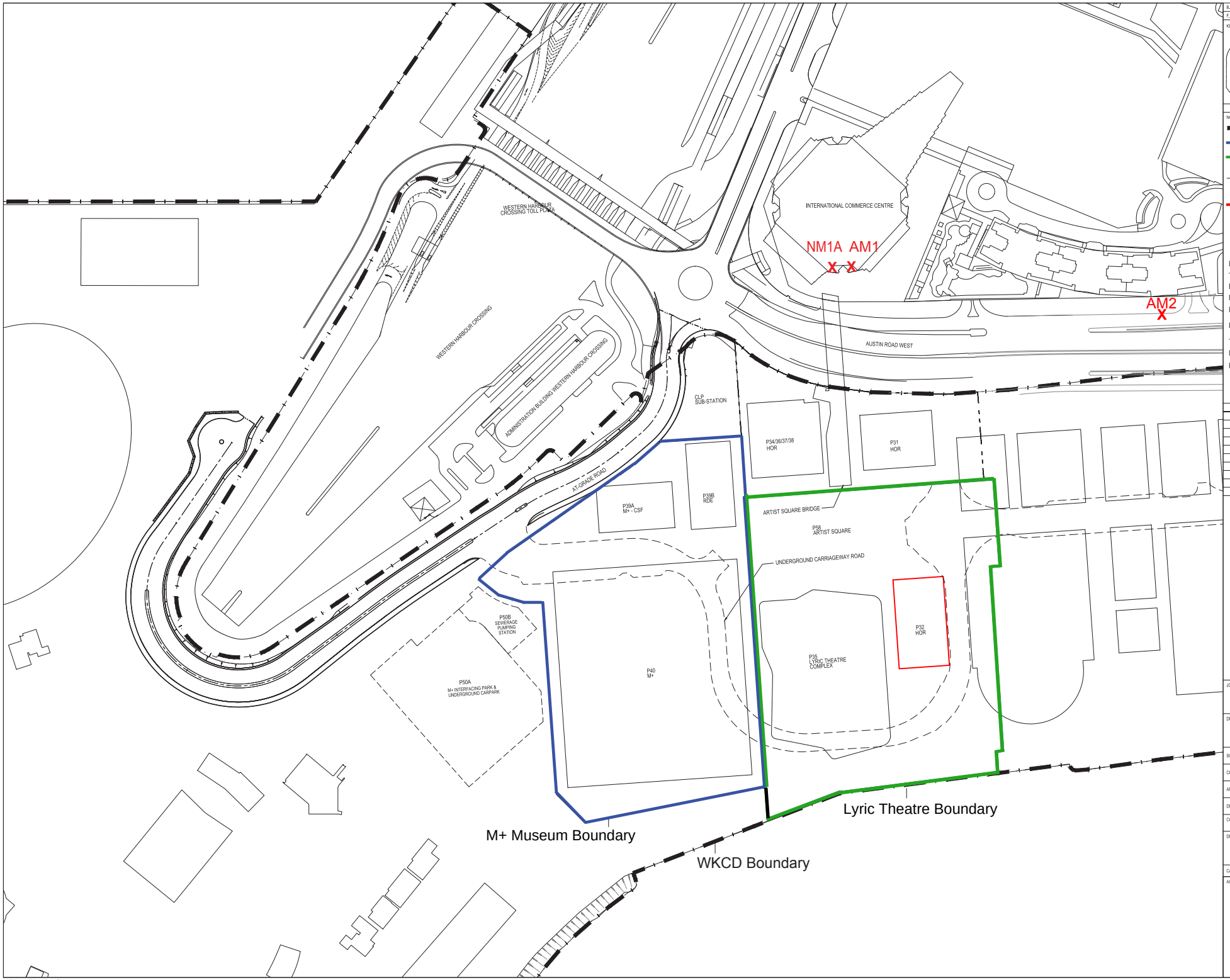
No environmental complaint was recorded in the reporting month. No notifications of summons or successful prosecutions were received during the reporting month.

Weekly construction phase site inspections and bi-weekly landscape and visual impact inspections were conducted during the reporting month as required. It was observed that the Contractors had implemented all possible and feasible mitigation measures to mitigate the potential environmental impacts during construction phase works.

## 8.2 Recommendations

Potential environmental impacts due to the construction activities, including air quality, noise, water quality, waste, landscape and visual, will be monitored or reviewed. The recommended environmental mitigation measures shall be implemented on site and regular inspections as required will be carried out to ensure that the environmental conditions are acceptable.

# Figure 1 Site Layout Plan and Monitoring Stations




B.D. REF:

F.S.D. REF:

KEY PLAN

KEY PLAN

NOTES:

WKCD BOUNDARY

M+ MUSEUM BOUNDARY

LYRIC THEATRE BOUNDARY

BOUNDARY OF UNDERPASS ROAD SERVING THE PLANNED WKCD

AREA HANDED OVER TO SUN HUNG KAI PROPERTIES

X CONSTRUCTION AIR/NOISE MONITORING STATIONS

REMARKS 1:

THE AIR MONITORING STATION AM2B HAS BEEN RELOCATED TO THE ALTERNATIVE MONITORING STATION AM2 AT THE G/F OF HARBOURSIDE ON 1 JUNE 2021

REMARKS 2:

THE SITE P32 (DELINEATED IN RED) WAS HANDED OVER TO SUN HUNG KAI PROPERTIES ON 31 JANUARY 2023.

| REV. | DATE | DESCRIPTION | INITIAL |
|---|---|---|---|

JOB TITLE: **M+ MUSEUM FOR VISUAL CULTURE (MAIN CONTRACT WORKS) & LYRIC THEATRE COMPLEX**

DRAWING TITLE: **PROPOSED LOCATIONS OF CONSTRUCTION AIR/NOISE MONITORING STATIONS**

| | | | |
|---|---|---|---|
| SCALE | 1:100 | PRINTED | A1 |
| CHECKED | | DATE | |
| APPROVED | | DATE | |
| DRAWN | | DATE | |
| CONTRACT NO. | | | |

DRAWING NO.: **FIGURE 1** REV.: XA

CAD REF NAME: XXXXX-AUT-PMS-DWG-P00-L000-0000-XXX.dwg

AUTHORITY

westKowloon 西九文化區

A1 (841mm x 594mm) Sheet Size

# Appendices

A. Project Organisation
B. Tentative Construction Programme
C. Action and Limit Levels for Construction Phase
D. Event and Action Plan for Air Quality, Noise, Landscape and Visual Impact
E. Monitoring Schedule
F. Calibration Certifications
G. Graphical Plots of the Monitoring Results
H. Meteorological Data Extracted from Hong Kong Observatory
I. Waste Flow table
J. Environmental Mitigation Measures – Implementation Status
K. Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions

# A. Project Organisation

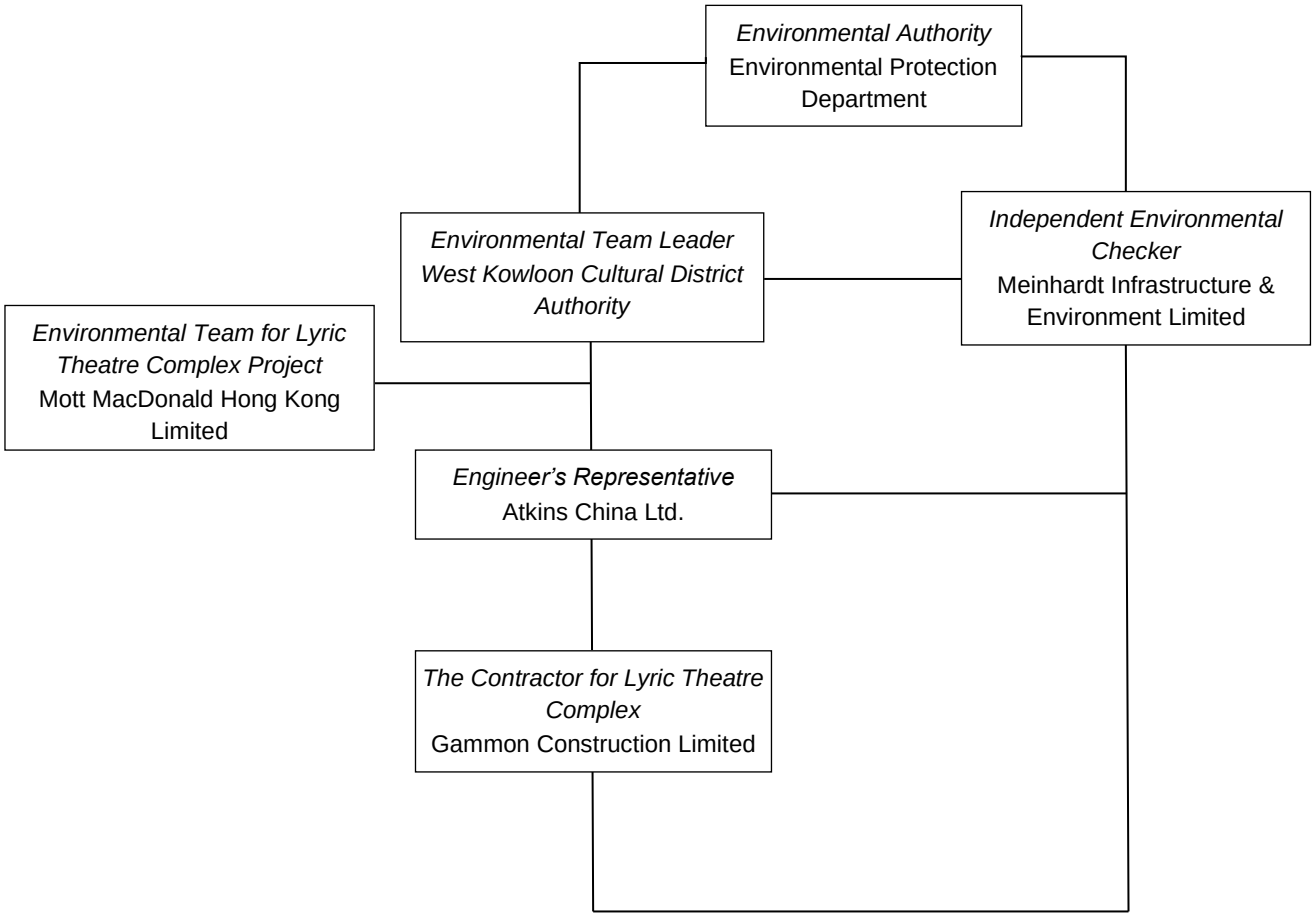



**Table A-1: Contact information**

| Company Name | Role | Name | Telephone | Email |
|---|---|---|---|---|
| Atkins China Ltd. | Project Manager | Mr. Simha LytheRao | 2204 8259 | Simha.Lytherao@atkinsglobal.com |
| Meinhardt Infrastructure & Environment Limited | Independent Environmental Checker | Ms. Claudine Lee | 2859 5409 | claudinelee@meinhardt.com.hk |
| Gammon Construction Limited (L2) | Environmental Manager | Ms. Fiona Law | 9156 7654 | fiona.cm.law@gammonconstruction.com |
| Mott MacDonald Hong Kong Ltd. | Contractor's Environmental Team Leader | Mr. Thomas Chan | 2828 5757 | thomas.chan@mottmac.com |
| West Kowloon Cultural District Authority | Senior Project Manager (Safety, Health and Environment) | Mr. C.K. Wu | 5506 9178 | ck.wu@wkcda.hk |

# B. Tentative Construction Programme

# TASK filter: UPD: Summary Level 1 Prog.



| ID | Activity | RD | EOT #1 Finish | Rev_3B START | Rev_3B FINISH | Current START | Current FINISH | EOT#1 VAR | R_3B VAR. | LM VAR | SUMM TF (approx) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *L2 CMWP_R_3_B - Rev_3B_02 2nd DRAFT [DD=31Mar24] ***L I V E*** | | | | | | | | | | | |
| **GENERAL & PRELIMINARIES** | | | | | | | | | | | |
| ***Contract Significant Dates*** | | | | | | | | | | | |
| **Commencement & Completion Dates - CMWP_Rev_01** | | | | | | | | | | | |
| **Section Keydates** | | | | | | | | | | | |
| KD05A | Complete Pedestrian Access Corr. & Floor Finishes at AURW | 0 | 28-Feb-21 | | 12-Nov-21 | | 12-Nov-21 A | -256 | 0 | 0 | |
| KD05B | Complete Required Pedestrian Access Corridor & associated top slab at Avenue Level [if instructed] | 0 | 14-Feb-21 | | 12-Nov-21 | | 12-Nov-21 A | -270 | 0 | 0 | |
| KD05 | PC for HO of the Remaining Works for M+ Promenade South | 0 | 24-Aug-20 | | 11-Sep-24 | | 11-Sep-24* | -1479 | 0 | 0 | 0 |
| KD08 | PC for HO Local ICT/Riser/SCR/TBE/MNO Rooms | 0 | 09-Aug-23 | | 07-Jan-26 | | 15-Jan-26* | -890 | -8 | -8 | -8 |
| KD10 | PC for HO of ASDA, Lyric Theatre Promenade South to Authority | 0 | 09-Aug-23 | | 07-Jan-26 | | 15-Jan-26* | -890 | -8 | -8 | -8 |
| KD09 | PC for HO of RDE areas for Tenancy Fit-out Wrks | 0 | 09-Aug-23 | | 07-Jan-26 | | 15-Jan-26* | -890 | -8 | -8 | -8 |
| KD11 | PC for HO of Extended Basement for HO to Authority & HO of CW to Relev. Gov Authority | 0 | 09-Aug-23 | | 07-Jan-26 | | 15-Jan-26* | -890 | -8 | -8 | -8 |
| KD07 | PRACTICAL COMPLETION for M+ Day 2 Works to the Authority | 0 | 09-Aug-23 | | 06-Feb-26 | | 14-Feb-26* | -920 | -8 | -8 | -8 |
| KD13 | PRACTICAL COMPLETION for LT, EB & C'Way 3B (Including PPE) | 0 | 06-Mar-24 | | 07-Aug-26 | | 15-Aug-26* | -892 | -8 | -8 | -8 |
| **Stage Keydates** | | | | | | | | | | | |
| KD03 | OBTAIN OP for Lyric Theatre & Extended Basement | 0 | 10-Jun-23 | | 07-Nov-25 | | 15-Nov-25* | -889 | -8 | -8 | -8 |
| KD01 | Compl Dsgn Coor/Subm and obtn NNO for L1 Contr Bsmt constn wrks | 0 | 20-Jul-19 | | 20-Jul-19 | | 20-Jul-19 A | 0 | 0 | 0 | |
| KD06 | PC for Fountain Related Plantroom(s) (allow access to Project Contractor) | 0 | 01-Apr-21 | | 22-Sep-22 | | 22-Sep-22 A | -538 | 0 | 0 | |
| KD14 | Complete all Necessary Works Incl. Integ_T&C along CW Z3a/Z3b for Rel_Authority Pre-Insp. | 0 | 31-Jan-23 | | 22-Nov-25 | | 01-Dec-25* | -1035 | -9 | -9 | -9 |
| KD02 | Obtain BA14 Acknowledge from BD for M+ Day2 A&A Works | 0 | 10-Jun-23 | | 06-Jan-26 | | 14-Jan-26* | -949 | -8 | -8 | -8 |
| ***CMWP - Summary Program - RSS*** | | | | | | | | | | | |
| SUM100 | [LoE] CC_B - Lyric Theatre | 523 | | 02-May-20 | 22-Jan-26 | 02-May-20 A | 30-Jan-26 | | -7 | -7 | 159 |
| SUM101 | [LoE] CC_C - ASDA and Lyric Theatre Promenade | 510 | | 12-Apr-21 | 07-Jan-26 | 12-Apr-21 A | 15-Jan-26 | | -7 | -7 | 172 |
| SUM102 | [LoE] CC_D - Remaining Works for M+ Promenade South | 118 | | 26-May-22 | 11-Sep-24 | 26-May-22 A | 11-Sep-24 | | 0 | 0 | 0 |
| SUM103 | [LoE] CC_E - DCS Cofferdam | 83 | | 07-Aug-20 | 04-Jul-24 | 07-Aug-20 A | 26-Jul-24 | | -15 | -8 | 73 |
| SUM104 | [LoE] CC_F - Modification to Existing Pump Cell | 197 | | 12-Oct-22 | 04-Dec-24 | 12-Oct-22 A | 21-Dec-24 | | -15 | -8 | 73 |
| SUM105 | [LoE] CC_G - Extended Basement | 341 | | 15-May-21 | 28-May-25 | 15-May-21 A | 28-May-25 | | 0 | 0 | 184 |
| SUM106 | [LoE] CC_H - Vibration Isolation Spring System Remaining as of 30Apr2020 | 0 | | 14-Apr-20 | 06-Feb-21 | 14-Apr-20 A | 06-Feb-21 A | | 0 | 0 | |
| SUM107 | [LoE] CC_I - Underpass and Associated Area | 350 | | 24-Feb-21 | 09-Jun-25 | 24-Feb-21 A | 09-Jun-25 | | 0 | 0 | 139 |
| SUM108 | [LoE] CC_J - M+ Day 2 Works | 505 | | 03-Jun-21 | 03-Dec-25 | 03-Jun-21 A | 11-Dec-25 | | -7 | -7 | 19 |
| SUM109 | [LoE] CC_K - Water Main at Promenade | 211 | | 23-Apr-22 | 10-Jan-25 | 23-Apr-22 A | 10-Jan-25 | | 0 | 3 | 125 |
| SUM110 | [LoE] CC_N - Lifts & Escalators | 420 | | 16-Aug-21 | 30-Aug-25 | 16-Aug-21 A | 30-Aug-25 | | 0 | 0 | 0 |
| SUM111 | [LoE] P32 Interim Development | 259 | | 17-May-21 | 14-Feb-25 | 17-May-21 A | 14-Feb-25 | | 0 | 0 | 266 |
| SUM112 | [LoE] Project Wide Stat. Inspections & Approval [LTC&EB FSD & BD Summary LTC/EB_3B & 3A)] | 146 | | 14-Jul-25 | 06-Jan-26 | 22-Jul-25 | 14-Jan-26 | | -7 | -7 | -7 |


Gammon

Base Line ACT
EOT#1 CD
Base Line MS
Milestone
Current - Other Works
Current - Struct Works
Current - MEP Works

Legend:
RD = Remaining Duration; BL = Base Line; LoE = Level of Effort Activity Type; LM = Last Month; SUMM = Summary; TF = Total Float; VAR = Variance

## L2 CMWP_R_3_B - Rev_3B_02 2nd DRAFT [DD=31Mar24] ***L I V E***

| Date | Revision | Checked | Approved |
|---|---|---|---|
| 15-Apr-24 | CMWP Rev_3_B Mar24 Update | NS | IH |
| | | | |
| | | | |
| | | | |
| | | | |

# C. Action and Limit Levels for Construction Phase

## Air Quality

The Action and Limit Levels for 1-hour and 24-hour TSP for the monitoring station are presented in following tables:

**Table C-1: Action and Limit Levels for 1-hour TSP**

| Monitoring Station | Action Level ($mg/m^3$) | Limit Level ($mg/m^3$) |
|---|---|---|
| AM1 | 273.7 | 500 |
| AM2 | 274.2 | 500 |

**Table C-2: Action and Limit Levels for 24-hour TSP**

| Monitoring Station | Action Level ($\mu g/m^3$) | Limit Level ($\mu g/m^3$) |
|---|---|---|
| AM1 | 143.6 | 260 |
| AM2 | 151.1 | 260 |

## Noise

The Action and Limit Levels for Noise for the monitoring stations are presented in following table:

**Table C-3: Action and Limit Levels for Construction Noise**

| Time Period & Monitoring Locations | Action Level | Limit Level |
|---|---|---|
| NM1A | | |
| 0700-1900 hours on normal weekdays | When one valid documented complaint is received. | 75 dB(A) |

# D. Event and Action Plan for Air Quality, Noise, Landscape and Visual Impact

## Air Quality

In case the Action and Limit Levels are not complied during construction stage, the following Event and Action Plan should be followed:

**Table D-1: Event and Action Plan for Air Quality**

| Event | Action | | | |
|---|---|---|---|---|
| | ET | IEC | WKCDA | Contractor |
| **Action Level** | | | | |
| 1. Exceedance for one sample | 1. Identify source, investigate the causes of exceedance and propose remedial measures;<br>2. Inform IEC and WKCDA;<br>3. Repeat measurement to confirm finding;<br>4. Increase monitoring frequency to daily. | 1. Check monitoring data submitted by ET;<br>2. Check Contractor's working method. | 1. Notify Contractor | 1. Rectify any unacceptable practice;<br>2. Amend working methods if appropriate. |
| 2. Exceedance for two or more consecutive samples | 1. Identify source;<br>2. Inform IEC and WKCDA;<br>3. Advise the WKCDA on the effectiveness of the proposed remedial measures;<br>4. Repeat measurements to confirm findings;<br>5. Increase monitoring frequency to daily;<br>6. Discuss with IEC and Contractor on remedial actions required;<br>7. If exceedance continues, arrange meeting with IEC and WKCDA;<br>8. If exceedance stops, cease additional monitoring. | 1. Check monitoring data submitted by ET;<br>2. Check Contractor's working method;<br>3. Discuss with ET and Contractor on possible remedial measures;<br>4. Advise the ET on the effectiveness of the proposed remedial measures;<br>5. Monitor the implementation of remedial measures. | 1. Confirm receipt of notification of failure in writing;<br>2. Notify Contractor;<br>3. Ensure remedial measures properly implemented. | 1. Submit proposals for remedial to WKCDA within three working days of notification;<br>2. Implement the agreed proposals;<br>3. Amend proposal if appropriate. |
| **Limit Level** | | | | |
| 1. Exceedance for one sample | 1. Identify source, investigate the causes of exceedance and propose remedial measures;<br>2. Inform WKCDA, Contractor and EPD;<br>3. Repeat measurement to confirm finding;<br>4. Increase monitoring frequency to daily;<br>5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and WKCDA informed of the results. | 1. Check monitoring data submitted by ET;<br>2. Check Contractor's working method;<br>3. Discuss with ET and Contractor on possible remedial measures;<br>4. Advise the WKCDA on the effectiveness of the proposed remedial measures;<br>5. Monitor the implementation of remedial measures. | 1. Confirm receipt of notification of failure in writing;<br>2. Notify Contractor;<br>3. Ensure remedial measures properly implemented. | 1. Take immediate action to avoid further exceedance;<br>2. Submit proposals for remedial actions to IEC within three working days of notification;<br>3. Implement the agreed proposals;<br>4. Amend proposal if appropriate. |

| Event | Action | | | |
|---|---|---|---|---|
| 2. Exceedance for two or more consecutive samples | 1. Notify IEC, WKCDA, Contractor and EPD;<br>2. Identify source;<br>3. Repeat measurement to confirm findings;<br>4. Increase monitoring frequency to daily;<br>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;<br>6. Arrange meeting with IEC and WKCDA to discuss the remedial actions to be taken;<br>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and WKCDA informed of the results;<br>8. If exceedance stops, cease additional monitoring. | 1. Check monitoring data submitted by ET;<br>2. Check Contractor's working method;<br>3. Discuss amongst WKCDA, ET, and Contractor on the potential remedial actions;<br>4. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the WKCDA accordingly;<br>5. Monitor the implementation of remedial measures. | 1. Confirm receipt of notification of failure in writing;<br>2. Notify Contractor;<br>3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented;<br>4. Ensure remedial measures properly implemented;<br>5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated. | 1. Take immediate action to avoid further exceedance;<br>2. Submit proposals for remedial actions to IEC within three working days of notification;<br>3. Implement the agreed proposals;<br>4. Resubmit proposals if problem still not under control;<br>5. Stop the relevant portion of works as determined by the WKCDA until the exceedance is abated. |

**Construction Noise**

In case the Action and Limit Levels are not complied during construction stage, the following Event and Action Plan should be followed:

**Table D-2: Event and Action Plan for Construction Noise**

| Event | Action | | | |
|---|---|---|---|---|
| | ET | IEC | WKCDA | Contractor |
| Action Level | 1. Notify WKCDA, IEC and Contractor;<br>2. Carry out investigation;<br>3. Report the results of investigation to the IEC, WKCDA and Contractor;<br>4. Discuss with the IEC and Contractor on remedial measures required;<br>5. Increase monitoring frequency to check mitigation effectiveness. | 1. Review the investigation results submitted by the ET;<br>2. Review the proposed remedial measures by the Contractor and advise the WKCDA accordingly;<br>3. Advise the WKCDA on the effectiveness of the proposed remedial measures. | 1. Confirm receipt of notification of failure in writing;<br>2. Notify Contractor;<br>3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented;<br>4. Supervise the implementation of remedial measures. | 1. Submit noise mitigation proposals to IEC and WKCDA;<br>2. Implement noise mitigation proposals. |
| Limit Level | 1. Inform IEC, WKCDA, Contractor and EPD;<br>2. Repeat measurements to confirm findings;<br>3. Increase monitoring frequency;<br>4. Identify source and investigate the cause of exceedance;<br>5. Carry out analysis of Contractor's working procedures;<br>6. Discuss with the IEC, Contractor and WKCDA on remedial measures required;<br>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and WKCDA informed of the results;<br>8. If exceedance stops, cease additional monitoring. | 1. Discuss amongst WKCDA, ET, and Contractor on the potential remedial actions;<br>2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the WKCDA accordingly. | 1. Confirm receipt of notification of failure in writing;<br>2. Notify Contractor;<br>3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented;<br>4. Supervise the implementation of remedial measures;<br>5. If exceedance continues, consider stopping the Contractor to continue working on that portion of work which causes the exceedance until the exceedance is abated. | 1. Take immediate action to avoid further exceedance;<br>2. Submit proposals for remedial actions to IEC and WKCDA within 3 working days of notification;<br>3. Implement the agreed proposals;<br>4. Submit further proposal if problem still not under control;<br>5. Stop the relevant portion of works as instructed by the WKCDA until the exceedance is abated. |

**Landscape and Visual Impact**

In case of non-compliance of landscape and visual impacts, procedures in accordance with the Event and Action Plan should be followed:

**Table D-3: Event and Action Plan for Landscape and Visual Impact**

| Event | Action | | | |
|---|---|---|---|---|
| | ET | IEC | WKCDA | Contractor |
| Design Check | 1. Design check to make sure the design complies with all the proposed mitigation measures in the EIA report;<br>2. Prepare and submit report. | 1. Check report submitted by ET;<br>2. Recommend remedial design if necessary. | 1. Undertake remedial design if necessary. | - |
| Non-conformity on one occasion | 1. Identify source of non-conformity;<br>2. Report to IEC and WKCDA;<br>3. Discuss remedial actions with IEC, WKCDA and Contractor;<br>4. Monitor remedial actions until rectification has been completed. | 1. Check and verify source of non-conformity;<br>2. Discuss remedial actions with ET and Contractor;<br>3. Advise WKCDA on effectiveness of proposed remedial actions;<br>4. Check implementation of remedial actions. | 1. Notify Contractor;<br>2. Ensure remedial actions are properly implemented. | 1. Amend working method as necessary;<br>2. Rectify damage and undertake necessary replacement and remedial actions. |
| Repeated non-conformity | 1. Identify source of non-conformity;<br>2. Report to IEC and WKCDA;<br>3. Increase monitoring frequency;<br>4. Discuss remedial actions with IEC, WKCDA and Contractor;<br>5. Monitor remedial actions until rectification has been completed;<br>6. If non-conformity rectified, reduce monitoring frequency back to normal. | 1. Check and verify source of non-conformity;<br>2. Check Contractor's working method;<br>3. Discuss remedial actions with ET and Contractor;<br>4. Advise WKCDA on effectiveness of proposed remedial actions;<br>5. Supervise implementation of remedial actions. | 1. Notify Contractor;<br>2. Ensure remedial actions are properly implemented. | 1. Amend working method as necessary;<br>2. Rectify damage and undertake necessary replacement and remedial actions. |

# E. Monitoring Schedule

# April 2024

March '24

| S | M | T | W | T | F | S |
|---|---|---|---|---|---|---|
| | | | | | 1 | 2 |
| 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | | | | | | |

May '24

| S | M | T | W | T | F | S |
|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 26 | 27 | 28 | 29 | 30 | 31 | |

June '24

| S | M | T | W | T | F | S |
|---|---|---|---|---|---|---|
| | | | | | | 1 |
| 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| 30 | | | | | | |

| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3<br>AM1, AM2 - 24hrTSP, 1hr TSP x3<br>NM1A - Noise Impact Monitoring<br>Lyric<br>Landscape & Visual Inspection | 4 | 5 | 6 |
| 7 | 8 | 9<br>AM1, AM2 - 24hrTSP, 1hr TSP x3<br>NM1A - Noise Impact Monitoring | 10 | 11 | 12 | 13 |
| 14 | 15<br>AM1, AM2 - 24hrTSP, 1hr TSP x3<br>NM1A - Noise Impact Monitoring | 16 | 17<br>Lyric<br>Landscape & Visual Inspection | 18 | 19 | 20<br>AM1, AM2 - 24hrTSP, 1hr TSP x3 |
| 21 | 22 | 23 | 24 | 25 | 26<br>AM1, AM2 - 24hrTSP, 1hr TSP x3<br>NM1A - Noise Impact Monitoring | 27 |
| 28 | 29 | 30 | | | | |

Notes

AM1 - International Commerce Centre (ICC)
AM2 - The Harbourside Tower 1 - Ground Floor
NM1A - International Commerce Centre (ICC)

# May 2024

April '24

| S | M | T | W | T | F | S |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| 28 | 29 | 30 | | | | |

June '24

| S | M | T | W | T | F | S |
|---|---|---|---|---|---|---|
| | | | | | | 1 |
| 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| 30 | | | | | | |

July '24

| S | M | T | W | T | F | S |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| 28 | 29 | 30 | 31 | | | |

| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|---|---|---|---|---|---|---|
| | | | 1 | 2<br>AM1, AM2 - 24hrTSP, 1hr TSP x3<br>NM1A - Noise Impact Monitoring | 3 | 4 |
| 5 | 6 | 7 | 8<br>AM1, AM2 - 24hrTSP, 1hr TSP x3<br>NM1A - Noise Impact Monitoring | 9 | 10 | 11 |
| 12 | 13<br>AM1, AM2 - 24hrTSP, 1hr TSP x3<br>NM1A - Noise Impact Monitoring | 14 | 15 | 16 | 17<br>AM1, AM2 - 24hrTSP, 1hr TSP x3 | 18 |
| 19 | 20 | 21 | 22 | 23<br>AM1, AM2 - 24hrTSP, 1hr TSP x3<br>NM1A - Noise Impact Monitoring | 24 | 25 |
| 26 | 27 | 28 | 29<br>AM1, AM2 - 24hrTSP, 1hr TSP x3<br>NM1A - Noise Impact Monitoring | 30 | 31 | |

Notes

AM1 - International Commerce Centre (ICC)

AM2 - The Harbourside Tower 1 - Ground Floor

NM1A - International Commerce Centre (ICC)

# F. Calibration Certifications

High-Volume TSP Sampler
5-Point Calibration Record

| | | |
|---|---|---|
| Location | : | AM1(ICC) |
| Calibrated by | : | K.T.Ho |
| Date | : | 08/03/2024 |

Sampler

| | | |
|---|---|---|
| Model | : | TE-5170 |
| Serial Number | : | S/N 0767 |

Calibration Orifice and Standard Calibration Relationship

| | | |
|---|---|---|
| Serial Number | : | 2454 |
| Next Calibration Date | : | 15 December 2024 |
| Slope (m) | : | 2.07544 |
| Intercept (b) | : | -0.03205 |
| Correlation Coefficient(r) | : | 0.99999 |

Standard Condition

| | | |
|---|---|---|
| Pstd (hpa) | : | 1013 |
| Tstd (K) | : | 298.18 |

Calibration Condition

| | | |
|---|---|---|
| Pa (hpa) | : | 1019 |
| Ta(K) | : | 290 |

| Resistance Plate | | dH [green liquid] (inch water) | Z | X=Qstd (cubic meter/min) | IC (chart) | Y (corrected) |
|---|---|---|---|---|---|---|
| 1 | 18 holes | 11.2 | 3.403 | 1.655 | 58 | 58.98 |
| 2 | 13 holes | 8.2 | 2.912 | 1.418 | 50 | 50.84 |
| 3 | 10 holes | 6.2 | 2.532 | 1.235 | 42 | 42.71 |
| 4 | 7 holes | 4.4 | 2.133 | 1.043 | 34 | 34.57 |
| 5 | 5 holes | 2.6 | 1.640 | 0.805 | 22 | 22.37 |

Notes:Z=SQRT{dH(Pa/Pstd)(Tstd/Ta)}, X=Z/m-b ,Y(Corrected Flow)=IC*{SQRT(Pa/Pstd)(Tstd/Ta)}

Sampler Calibration Relationship

Slope(m):43.138 Intercept(b):-11.230 Correlation Coefficient(r): 0.9972

Checked by:_____ Date: 09/03/2024

Magnum Fan

TISCH Environmental

| RECALIBRATION DUE DATE: |
|---|
| December 15, 2024 |

# Certificate of Calibration

| Calibration Certification Information | | | | |
|---|---|---|---|---|
| **Cal. Date:** | December 15, 2023 | **Rootsmeter S/N:** 438320 | **Ta:** 295 | °K |
| **Operator:** | Jim Tisch | | **Pa:** 748.5 | mm Hg |
| **Calibration Model #:** | TE-5025A | **Calibrator S/N:** **2454** | | |

| Run | Vol. Init (m3) | Vol. Final (m3) | ΔVol. (m3) | ΔTime (min) | ΔP (mm Hg) | ΔH (in H2O) |
|---|---|---|---|---|---|---|
| 1 | 1 | 2 | 1 | 1.4250 | 3.2 | 2.00 |
| 2 | 3 | 4 | 1 | 1.0090 | 6.4 | 4.00 |
| 3 | 5 | 6 | 1 | 0.9040 | 7.9 | 5.00 |
| 4 | 7 | 8 | 1 | 0.8610 | 8.8 | 5.50 |
| 5 | 9 | 10 | 1 | 0.7110 | 12.8 | 8.00 |

**Data Tabulation**

| Vstd (m3) | Qstd (x-axis) | $\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$ (y-axis) | Va | Qa (x-axis) | $\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis) |
|---|---|---|---|---|---|
| 0.9907 | 0.6952 | 1.4106 | 0.9957 | 0.6988 | 0.8878 |
| 0.9864 | 0.9776 | 1.9949 | 0.9914 | 0.9826 | 1.2556 |
| 0.9844 | 1.0890 | 2.2304 | 0.9894 | 1.0945 | 1.4037 |
| 0.9832 | 1.1420 | 2.3393 | 0.9882 | 1.1478 | 1.4723 |
| 0.9779 | 1.3754 | 2.8213 | 0.9829 | 1.3824 | 1.7756 |
| **QSTD** | **m=** | **2.07544** | **QA** | **m=** | **1.29961** |
| | **b=** | **-0.03205** | | **b=** | **-0.02017** |
| | **r=** | **0.99999** | | **r=** | **0.99999** |

**Calculations**

| | | | |
|---|---|---|---|
| **Vstd=** | ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta) | **Va=** | ΔVol((Pa-ΔP)/Pa) |
| **Qstd=** | Vstd/ΔTime | **Qa=** | Va/ΔTime |

**For subsequent flow rate calculations:**

**Qstd=** $1/m\left(\left(\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}\right)-b\right)$

**Qa=** $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

| Standard Conditions | |
|---|---|
| Tstd: | 298.15 °K |
| Pstd: | 760 mm Hg |

| Key |
|---|
| ΔH: calibrator manometer reading (in H2O) |
| ΔP: rootsmeter manometer reading (mm Hg) |
| Ta: actual absolute temperature (°K) |
| Pa: actual barometric pressure (mm Hg) |
| b: intercept |
| m: slope |

**RECALIBRATION**

US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30

Tisch Environmental, Inc.
145 South Miami Avenue
Village of Cleves, OH 45002

www.tisch-env.com
TOLL FREE: (877)263-7610
FAX: (513)467-9009

# ALS Technichem (HK) Pty Ltd

## ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

## SUB-CONTRACTING REPORT

| | | | |
|---|---|---|---|
| CONTACT | : MR MAGNUM FAN | WORK ORDER | : HK2317764 |
| CLIENT | : ENVIROTECH SERVICES CO. | | |
| ADDRESS | : RM 712, 7/F, MY LOFT 9 HOI WING ROAD, TUEN MUN, N.T., HK | SUB-BATCH | : 1 |
| | | DATE RECEIVED | : 8-MAY-2023 |
| | | DATE OF ISSUE | : 17-MAY-2023 |
| PROJECT | : --- | NO. OF SAMPLES | : 1 |
| | | CLIENT ORDER | : --- |

### *General Comments*

- Sample information (Project name, Sample ID, Sampling date/time, etc.) is provided by client.
- Result(s) of sample(s) is/are reported on as received basis, unless otherwise specified. The result(s) is/are related only to the item(s) tested.
- No sample is received in this Work Order. The report presents non-laboratory testing data only.
- Calibration was subcontracted to and analysed by Envirotech Services Co.

### *Signatories*

This document has been signed by those names that appear on this report and are the authorised signatories

| *Signatories* | *Position* |
|---|---|
| Richard Fung | Managing Director |

This report supersedes any previous report(s) with the same work order number.

All pages of this report have been checked and approved for release.

**ALS Technichem (HK) Pty Ltd**
Part of the **ALS Laboratory Group**

11/F. Chung Shun Knitting Centre 1 - 3 Wing Yip Street Kwai Chung N.T. Hong Kong
Tel. +852 2610 1044 Fax. +852 2610 2021 www.alsglobal.com

WORK ORDER : HK2317764
SUB-BATCH : 1
CLIENT : ENVIROTECH SERVICES CO.
PROJECT : —

| ALS Lab ID | Client's Sample ID | Sample Type | Sample Date | External Lab Report No. |
|---|---|---|---|---|
| HK2317764-001 | SIBATA (841274) | Equipments | 08-May-2023 | S/N: 841724 |

Envirotech Services Co.
Rm. 712, 7/F
My Loft,
9 Hoi Wing Road,
Tuen Mun, H.K.
Tel : 2560 3450
Fax : 2560 6553
E-mail: envirotech@netvigator.com

## Equipment Verification Report (TSP)

**Equipment Calibrated:**

| | |
|---|---|
| Type: | Laser Dust Monitor |
| Manufacturer: | Sibata LD-5R |
| Serial No.: | 841724 |
| Equipment Ref.: | N/A |
| ALS Job Order: | HK2316019 |

**Standard Equipment**

| | |
|---|---|
| Standard Equipment: | High Volume Sampler (TSP) |
| Location & Location ID: | Envirotech Room (Calibration Room) |
| Equipment Ref.: | HVS 8162 |
| Last Calibration Date: | 28-Feb-2023 |

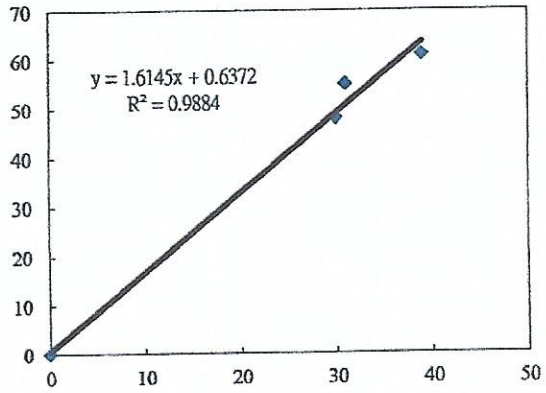
**Equipment Verification Results:**

Verification Date: 21, 22 & 24 April 2023

| Hour | Time | Mean Temp °C | Mean Pressure (hpa) | Concentration in µg/m³ (Standard Equipment) | Total Count (Calibrated Equipment) | Count /Minute (Total Count/min) |
|---|---|---|---|---|---|---|
| 1hr 00mins | 1410-1510 | 27.1 | 1006.1 | 61 | 2357 | 39 |
| 1hr 00mins | 1500-1600 | 23.2 | 1005.7 | 55 | 1861 | 31 |
| 1hr 00mins | 1400-1500 | 25.0 | 1015.6 | 48 | 1802 | 30 |

**Linear Regression of Y or X**

| | |
|---|---|
| Slope (K-factor): | 1.6145(µg/m³)/CPM |
| Correlation Coefficient (R): | 0.9942 |
| Date of Issue: | 2-May-2023 |




Remarks:

1 . Strong Correlation (>0.8)

2. Factor 1.6145 (µg/m³)/CPM should be applied for TSP monitoring

*If R<0.5, repair or verification is required for the equipment

Operator: P.F.Yeung Signature Fai Date: 2 May 2023

QC Reviewer: K.F.Ho Signature Fat Date: 2 May 2023

# TSP SAMPLER CALIBRATION CACULATION SPREADSHEET

| | | | |
|---|---|---|---|
| Location : | Rm. 712, My Loft, Tuen Mun | Date of Calibration: | 28-Feb-23 |
| HVS ID: | 8162 | Next Calibration Date: | 28-Apr-23 |
| Name and Model : | TISCH HVS Model TE-5170 | Operator: | K.F.Ho |

## CONDITIONS

| | | | |
|---|---|---|---|
| Sea Level Pressure (hpa) | 1021 | Corrected Pressure (mm Hg) | 764.3 |
| Temperature (°C) | 22.0 | Temperature (K) | 295 |

## CALIBRATION ORIFICE

| | | | |
|---|---|---|---|
| Make: | TISCH | Qstd Slope | 2.06918 |
| Model: | TE-5025A | Qstd Intercept | -0.04220 |
| Serial#: | 2454 | | |

## CALIBRATION

| Plate No. | H2O(L) (in) | H20(R) (in) | H2O (in) | Qstd (m3/min) | I (chart) | IC (corrected) | LINEAR REGRESSION |
|---|---|---|---|---|---|---|---|
| 18 | 6.7 | 6.6 | 13.3 | 1.797 | 62 | 62.51 | Slope= 31.428 |
| 13 | 5.2 | 5.1 | 10.3 | 1.584 | 55 | 55.45 | Intercept= 5.569 |
| 10 | 4.0 | 3.9 | 7.9 | 1.390 | 48 | 48.39 | Corr. Coeff.= 0.9990 |
| 7 | 2.5 | 2.5 | 5.0 | 1.110 | 40 | 40.33 | |
| 5 | 1.4 | 1.4 | 2.8 | 0.836 | 32 | 32.26 | |

**Calulations:**

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]

IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

**For subsequent calculation of sampler flow:**

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

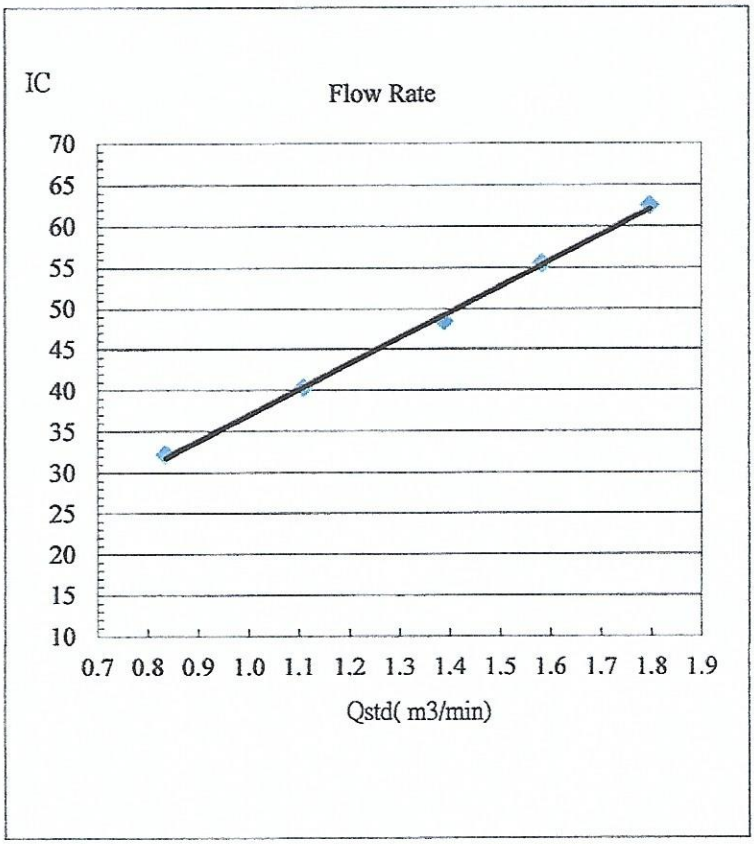
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TISCH Environmental

| RECALIBRATION DUE DATE: |
|---|
| December 15, 2023 |

# Certificate of Calibration

| Calibration Certification Information | | | | |
|---|---|---|---|---|
| **Cal. Date:** | December 15, 2022 | **Rootsmeter S/N:** 438320 | **Ta:** 295 | °K |
| **Operator:** | Jim Tisch | | **Pa:** 748.0 | mm Hg |
| **Calibration Model #:** | TE-5025A | **Calibrator S/N:** **4064** | | |

| Run | Vol. Init (m3) | Vol. Final (m3) | ΔVol. (m3) | ΔTime (min) | ΔP (mm Hg) | ΔH (in H2O) |
|---|---|---|---|---|---|---|
| 1 | 1 | 2 | 1 | 1.4430 | 3.2 | 2.00 |
| 2 | 3 | 4 | 1 | 1.0210 | 6.4 | 4.00 |
| 3 | 5 | 6 | 1 | 0.9170 | 7.9 | 5.00 |
| 4 | 7 | 8 | 1 | 0.8730 | 8.8 | 5.50 |
| 5 | 9 | 10 | 1 | 0.7210 | 12.8 | 8.00 |

**Data Tabulation**

| Vstd (m3) | Qstd (x-axis) | $\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$ (y-axis) | Va | Qa (x-axis) | $\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis) |
|---|---|---|---|---|---|
| 0.9900 | 0.6861 | 1.4101 | 0.9957 | 0.6900 | 0.8881 |
| 0.9858 | 0.9655 | 1.9943 | 0.9914 | 0.9711 | 1.2560 |
| 0.9838 | 1.0728 | 2.2296 | 0.9894 | 1.0790 | 1.4042 |
| 0.9826 | 1.1255 | 2.3385 | 0.9882 | 1.1320 | 1.4728 |
| 0.9772 | 1.3554 | 2.8203 | 0.9829 | 1.3632 | 1.7762 |
| **QSTD** | **m=** | **2.10977** | **QA** | **m=** | **1.32110** |
| | **b=** | **-0.03782** | | **b=** | **-0.02382** |
| | **r=** | **0.99998** | | **r=** | **0.99998** |

**Calculations**

| | | | |
|---|---|---|---|
| **Vstd=** | ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta) | **Va=** | ΔVol((Pa-ΔP)/Pa) |
| **Qstd=** | Vstd/ΔTime | **Qa=** | Va/ΔTime |

**For subsequent flow rate calculations:**

**Qstd=** $1/m\left(\left(\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}\right)-b\right)$

**Qa=** $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

| Standard Conditions | |
|---|---|
| Tstd: | 298.15 °K |
| Pstd: | 760 mm Hg |

| Key |
|---|
| ΔH: calibrator manometer reading (in H2O) |
| ΔP: rootsmeter manometer reading (mm Hg) |
| Ta: actual absolute temperature (°K) |
| Pa: actual barometric pressure (mm Hg) |
| b: intercept |
| m: slope |

**RECALIBRATION**

US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30

Tisch Environmental, Inc.
145 South Miami Avenue
Village of Cleves, OH 45002

www.tisch-env.com
TOLL FREE: (877)263-7610
FAX: (513)467-9005

# ALS Technichem (HK) Pty Ltd

## ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

## SUB-CONTRACTING REPORT

| | | | |
|---|---|---|---|
| CONTACT | : MR MAGNUM FAN | WORK ORDER | : HK2321489 |
| CLIENT | : ENVIROTECH SERVICES CO. | | |
| ADDRESS | : RM 712, 7/F, MY LOFT 9 HOI WING ROAD, TUEN MUN, N.T., HK | SUB-BATCH | : 1 |
| | | DATE RECEIVED | : 2-JUN-2023 |
| | | DATE OF ISSUE | : 8-JUN-2023 |
| PROJECT | : --- | NO. OF SAMPLES | : 1 |
| | | CLIENT ORDER | : --- |

### General Comments

- No sample is received in this Work Order. The report presents non-laboratory testing data only.
- Sample information (Project name, Sample ID, Sampling date/time, etc.) is provided by client.
- Result(s) of sample(s) is/are reported on as received basis, unless otherwise specified. The result(s) is/are related only to the item(s) tested.
- Calibration was subcontracted to Envirotech Services Company.

### Signatories

This document has been signed by those names that appear on this report and are the authorised signatories

| *Signatories* | *Position* |
|---|---|
| Richard Fung | Managing Director |

This report supersedes any previous report(s) with the same work order number.

All pages of this report have been checked and approved for release.

**ALS Technichem (HK) Pty Ltd**
Part of the **ALS Laboratory Group**

11/F. Chung Shun Knitting Centre 1 - 3 Wing Yip Street Kwai Chung N.T. Hong Kong
**Tel. +852 2610 1044** Fax. +852 2610 2021 **www.alsglobal.com**

WORK ORDER : HK2321489
SUB-BATCH : 1
CLIENT : ENVIROTECH SERVICES CO.
PROJECT : ----

| ALS Lab ID | Client's Sample ID | Sample Type | Sample Date | External Lab Report No. |
|---|---|---|---|---|
| HK2321489-001 | SIBATA (456668) | Equipments | 25-May-2023 | S/N: 456668 |

Envirotech Services Co.
Rm. 712, 7/F
My Loft,
9 Hoi Wing Road,
Tuen Mun, N.K.
Tel : 2560 8450
Fax : 2560 6553
E-mail: envirotech@netvigator.com

## Equipment Verification Report (TSP)

**Equipment Calibrated:**

| | |
|---|---|
| Type: | Laser Dust Monitor |
| Manufacturer: | Sibata LD-3B |
| Serial No.: | 456668 |
| Equipment Ref.: | N/A |
| ALS Job Order: | HK2320686 |

**Standard Equipment**

| | |
|---|---|
| Standard Equipment: | High Volume Sampler (TSP) |
| Location & Location ID: | Envirotech Room (Calibration Room) |
| Equipment Ref.: | HVS 8162 |
| Last Calibration Date: | 26-Apr-2023 |

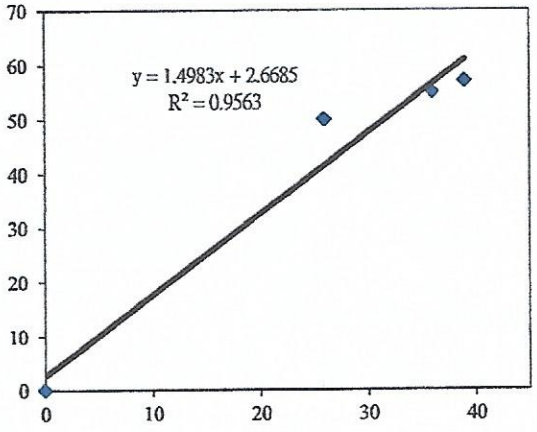
**Equipment Verification Results:**

Verification Date: 25, 26 & 27 May 2023

| Hour | Time | Mean Temp °C | Mean Pressure (hpa) | Concentration in µg/m³ (Standard Equipment) | Total Count (Calibrated Equipment) | Count /Minute (Total Count/min) |
|---|---|---|---|---|---|---|
| 1hr 00mins | 1620-1720 | 27.5 | 1011.2 | 57 | 2334 | 39 |
| 1hr 00mins | 1030-1130 | 28.5 | 1013.6 | 55 | 2165 | 36 |
| 1hr 00mins | 0915-1015 | 28.8 | 1011.1 | 50 | 1537 | 26 |

**Linear Regression of Y or X**

| | |
|---|---|
| Slope (K-factor): | 1.4983(µg/m³)/CPM |
| Correlation Coefficient (R): | 0.9779 |
| Date of Issue: | 1-Jun-2023 |




Remarks:

1 . Strong Correlation (>0.8)

2. Factor 1.4983 (µg/m³)/CPM should be applied for TSP monitoring

*If R<0.5, repair or verification is required for the equipment

Operator: P.F.Yeung Signature Faj Date: 01 June 2023

QC Reviewer: K.F.Ho Signature Fat Date: 01 June 2023

# TSP SAMPLER CALIBRATION CACULATION SPREADSHEET

| | | | |
|---|---|---|---|
| Location : | Rm. 712, My Loft, Tuen Mun | Date of Calibration: | 23-Apr-23 |
| HVS ID: | 8162 | Next Calibration Date: | 23-Jun-23 |
| Name and Model : | TISCH HVS Model TE-5170 | Operator: | P.F.Yeung |

## CONDITIONS

| | | | |
|---|---|---|---|
| Sea Level Pressure (hpa) | 1016 | Corrected Pressure (mm Hg) | 762.1 |
| Temperature (°C) | 20.0 | Temperature (K) | 293 |

## CALIBRATION ORIFICE

| | | | |
|---|---|---|---|
| Make: | TISCH | Qstd Slope | 2.06918 |
| Model: | TE-5025A | Qstd Intercept | -0.04220 |
| Serial#: | 2454 | | |

## CALIBRATION

| Plate No. | H2O(L) (in) | H20(R) (in) | H2O (in) | Qstd (m3/min) | I (chart) | IC (corrected) | LINEAR REGRESSION |
|---|---|---|---|---|---|---|---|
| 18 | 6.5 | 6.5 | 13.0 | 1.781 | 62 | 62.63 | Slope= 33.351 |
| 13 | 4.9 | 4.9 | 9.8 | 1.549 | 58 | 58.59 | Intercept= 5.042 |
| 10 | 3.7 | 3.7 | 7.4 | 1.348 | 50 | 50.51 | Corr. Coeff.= 0.9932 |
| 7 | 2.2 | 2.2 | 4.4 | 1.044 | 40 | 40.40 | |
| 5 | 1.5 | 1.4 | 2.9 | 0.852 | 32 | 32.32 | |

**Calulations:**

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]

IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

**For subsequent calculation of sampler flow:**

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

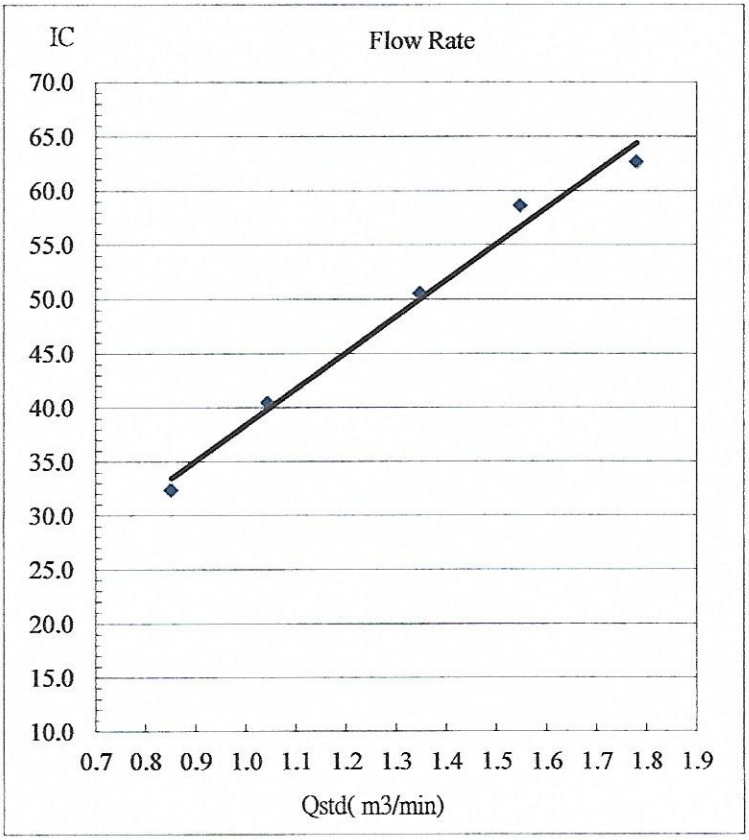
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TISCH Environmental

| RECALIBRATION DUE DATE: |
|---|
| December 15, 2023 |

# Certificate of Calibration

| Calibration Certification Information | | | | |
|---|---|---|---|---|
| **Cal. Date:** | December 15, 2022 | **Rootsmeter S/N:** 438320 | **Ta:** 295 | °K |
| **Operator:** | Jim Tisch | | **Pa:** 748.0 | mm Hg |
| **Calibration Model #:** | TE-5025A | **Calibrator S/N:** **4064** | | |

| Run | Vol. Init (m3) | Vol. Final (m3) | ΔVol. (m3) | ΔTime (min) | ΔP (mm Hg) | ΔH (in H2O) |
|---|---|---|---|---|---|---|
| 1 | 1 | 2 | 1 | 1.4430 | 3.2 | 2.00 |
| 2 | 3 | 4 | 1 | 1.0210 | 6.4 | 4.00 |
| 3 | 5 | 6 | 1 | 0.9170 | 7.9 | 5.00 |
| 4 | 7 | 8 | 1 | 0.8730 | 8.8 | 5.50 |
| 5 | 9 | 10 | 1 | 0.7210 | 12.8 | 8.00 |

**Data Tabulation**

| Vstd (m3) | Qstd (x-axis) | $\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$ (y-axis) | Va | Qa (x-axis) | $\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis) |
|---|---|---|---|---|---|
| 0.9900 | 0.6861 | 1.4101 | 0.9957 | 0.6900 | 0.8881 |
| 0.9858 | 0.9655 | 1.9943 | 0.9914 | 0.9711 | 1.2560 |
| 0.9838 | 1.0728 | 2.2296 | 0.9894 | 1.0790 | 1.4042 |
| 0.9826 | 1.1255 | 2.3385 | 0.9882 | 1.1320 | 1.4728 |
| 0.9772 | 1.3554 | 2.8203 | 0.9829 | 1.3632 | 1.7762 |
| **QSTD** | **m=** | **2.10977** | **QA** | **m=** | **1.32110** |
| | **b=** | **-0.03782** | | **b=** | **-0.02382** |
| | **r=** | **0.99998** | | **r=** | **0.99998** |

**Calculations**

| | | | |
|---|---|---|---|
| **Vstd=** | ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta) | **Va=** | ΔVol((Pa-ΔP)/Pa) |
| **Qstd=** | Vstd/ΔTime | **Qa=** | Va/ΔTime |

**For subsequent flow rate calculations:**

**Qstd=** $1/m\left(\left(\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}\right)-b\right)$

**Qa=** $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

| Standard Conditions | |
|---|---|
| Tstd: | 298.15 °K |
| Pstd: | 760 mm Hg |

| Key |
|---|
| ΔH: calibrator manometer reading (in H2O) |
| ΔP: rootsmeter manometer reading (mm Hg) |
| Ta: actual absolute temperature (°K) |
| Pa: actual barometric pressure (mm Hg) |
| b: intercept |
| m: slope |

| RECALIBRATION |
|---|
| US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30 |

Tisch Environmental, Inc.
145 South Miami Avenue
Village of Cleves, OH 45002

www.tisch-env.com
TOLL FREE: (877)263-7610
FAX: (513)467-9009

# ALS Technichem (HK) Pty Ltd

## ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

## SUB-CONTRACTING REPORT

| | | | |
|---|---|---|---|
| CONTACT | : MR MAGNUM FAN | WORK ORDER | : HK2351432 |
| CLIENT | : ENVIROTECH SERVICES CO. | | |
| ADDRESS | : RM 712, 7/F, MY LOFT 9 HOI WING ROAD, TUEN MUN, N.T. HK | SUB-BATCH | : 1 |
| | | DATE RECEIVED | : 18-DEC-2023 |
| | | DATE OF ISSUE | : 27-DEC-2023 |
| PROJECT | : ---- | NO. OF SAMPLES | : 1 |
| | | CLIENT ORDER | : ---- |

### General Comments

- Sample information (Project name, Sample ID, Sampling date/time, etc.) is provided by client.
- Result(s) of sample(s) is/are reported on as received basis, unless otherwise specified. The result(s) is/are related only to the item(s) tested.
- Calibration was subcontracted to Envirotech Services Company.
- Sample(s) was/ were submitted by client. Sample(s) arrived laboratory in ambient condition.

### Signatories

This document has been signed by those names that appear on this report and are the authorised signatories

| Signatories | Position |
|---|---|
| Richard Fung | Managing Director |

This report supersedes any previous report(s) with the same work order number.

All pages of this report have been checked and approved for release.

ALS Technichem (HK) Pty Ltd
Part of the ALS Laboratory Group

11/F Chung Shun Knitting Centre 1 - 3 Wing Yip Street Kwai Chung N.T. Hong Kong
Tel. +852 2610 1044 Fax +852 2610 2021 www.alsglobal.com

| | |
|---|---|
| WORK ORDER | : HK2351432 |
| SUB-BATCH | : 1 |
| CLIENT | : ENVIROTECH SERVICES CO. |
| PROJECT | : ---- |

| ALS Lab ID | Client's Sample ID | Sample Type | Sample Date | External Lab Report No. |
|---|---|---|---|---|
| HK2351432-001 | Sibata LD-3B (235780) | Equipments | 09-Dec-2023 | S/N: 235780 |

Envirotech Services Co.
Rm. 712, 7/F
My Loft,
9 Hoi Wing Road,
Tuen Mun, H.K.
Tel : 2580 8460
Fax : 2580 8563
E-mail: envirotech@netvigator.com

## Equipment Verification Report (TSP)

**Equipment Calibrated:**

| | |
|---|---|
| Type: | Laser Dust Monitor |
| Manufacturer: | Sibata LD-3B |
| Serial No.: | 235780 |
| Equipment Ref.: | N/A |
| ALS Job Order: | HK2349963 |

**Standard Equipment**

| | |
|---|---|
| Standard Equipment: | High Volume Sampler (TSP) |
| Location : | Envirotech Room (Calibration Room) |
| Equipment Ref.: | HVS 8162 |
| Last Calibration Date: | 13-Oct-2023 |

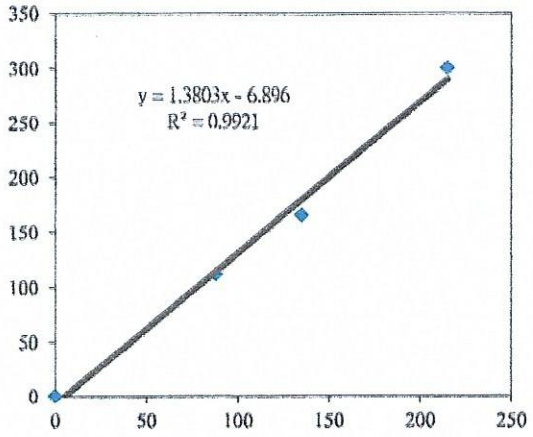
**Equipment Verification Results:**

Verification Date: 9-Dec-2023

| Hour | Time | Mean Temp °C | Mean Pressure (hpa) | Concentration in µg/m³ (Standard Equipment) Y( axis) | Concentration in µg/m³ (Calibrated Equipment) x( axis) |
|---|---|---|---|---|---|
| 1hr 00mins | 1010-1110 | 26.5 | 1016.0 | 112 | 88 |
| 2hr 00mins | 1300-1500 | 26.2 | 1015.5 | 165 | 135 |
| 3hr 00mins | 1505-1805 | 26.2 | 1015.5 | 300 | 215 |

**Linear Regression of Y or X**

| | |
|---|---|
| Slope (K-factor): | 1.3803(µg/m³)/CPM |
| Correlation Coefficient (R): | 0.9960 |
| Date of Issue: | 15-Dec-2023 |




Remarks:

1 . Strong Correlation (>0.8)

2. Factor 1.3803 (µg/m³)/CPM should be applied for TSP monitoring

*If R<0.5, repair or verification is required for the equipment

Operator: P.F.Yeung Signature P.F.Y Date: 15 December 2023

QC Reviewer: K.F.Ho Signature K.F.Ho Date: 15 December 2023

# TSP SAMPLER CALIBRATION CACULATION SPREADSHEET

| | | | |
|---|---|---|---|
| Location : | Rm. 712, My Loft, Tuen Mun | Date of Calibration: | 13-Oct-23 |
| HVS ID: | 8162 | Next Calibration Date: | 12-Dec-23 |
| Name and Model : | TISCH HVS Model TE-5170 | Operator: | P.F.Yeung |

## CONDITIONS

| | | | |
|---|---|---|---|
| Sea Level Pressure (hpa) | 1015 | Corrected Pressure (mm Hg) | 762.1 |
| Temperature (°C) | 28.9 | Temperature (K) | 293 |

## CALIBRATION ORIFICE

| | | | |
|---|---|---|---|
| Make: | TISCH | Qstd Slope | 2.06918 |
| Model: | TE-5025A | Qstd Intercept | -0.04220 |
| Serial#: | 2454 | | |

## CALIBRATION

| Plate No. | H2O(L) (in) | H20(R) (in) | H2O (in) | Qstd (m3/min) | I (chart) | IC (corrected) | LINEAR REGRESSION |
|---|---|---|---|---|---|---|---|
| 18 | 6.5 | 6.5 | 13.0 | 1.806 | 62 | 63.54 | Slope= 32.843 |
| 13 | 4.7 | 4.7 | 9.4 | 1.539 | 56 | 57.39 | Intercept= 5.518 |
| 10 | 3.4 | 3.4 | 6.8 | 1.312 | 49 | 50.22 | Corr. Coeff.= 0.9939 |
| 7 | 2.3 | 2.2 | 4.5 | 1.071 | 40 | 40.99 | |
| 5 | 1.6 | 1.5 | 3.1 | 0.892 | 33 | 33.82 | |

Calulations:

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]

IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

**For subsequent calculation of sampler flow:**

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

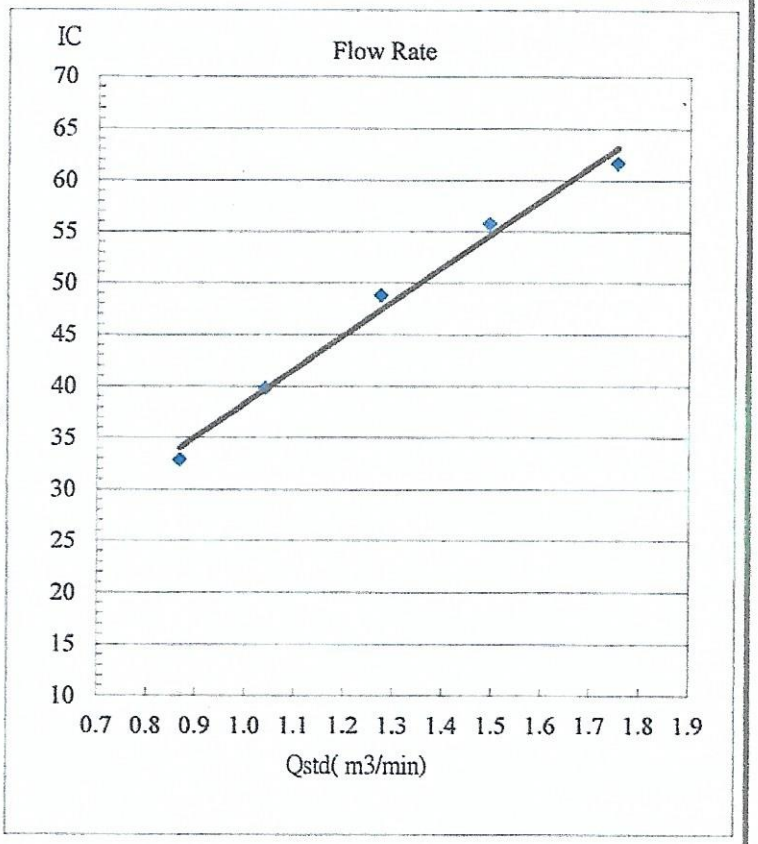
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TISCH Environmental

| RECALIBRATION DUE DATE: |
|---|
| December 15, 2023 |

# Certificate of Calibration

| Calibration Certification Information | | | | |
|---|---|---|---|---|
| **Cal. Date:** | December 15, 2022 | **Rootsmeter S/N:** 438320 | **Ta:** 295 | °K |
| **Operator:** | Jim Tisch | | **Pa:** 748.0 | mm Hg |
| **Calibration Model #:** | TE-5025A | **Calibrator S/N:** **4064** | | |

| Run | Vol. Init (m3) | Vol. Final (m3) | ΔVol. (m3) | ΔTime (min) | ΔP (mm Hg) | ΔH (in H2O) |
|---|---|---|---|---|---|---|
| 1 | 1 | 2 | 1 | 1.4430 | 3.2 | 2.00 |
| 2 | 3 | 4 | 1 | 1.0210 | 6.4 | 4.00 |
| 3 | 5 | 6 | 1 | 0.9170 | 7.9 | 5.00 |
| 4 | 7 | 8 | 1 | 0.8730 | 8.8 | 5.50 |
| 5 | 9 | 10 | 1 | 0.7210 | 12.8 | 8.00 |

**Data Tabulation**

| Vstd (m3) | Qstd (x-axis) | $\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$ (y-axis) | Va | Qa (x-axis) | $\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis) |
|---|---|---|---|---|---|
| 0.9900 | 0.6861 | 1.4101 | 0.9957 | 0.6900 | 0.8881 |
| 0.9858 | 0.9655 | 1.9943 | 0.9914 | 0.9711 | 1.2560 |
| 0.9838 | 1.0728 | 2.2296 | 0.9894 | 1.0790 | 1.4042 |
| 0.9826 | 1.1255 | 2.3385 | 0.9882 | 1.1320 | 1.4728 |
| 0.9772 | 1.3554 | 2.8203 | 0.9829 | 1.3632 | 1.7762 |
| **QSTD** | **m=** | **2.10977** | **QA** | **m=** | **1.32110** |
| | **b=** | **-0.03782** | | **b=** | **-0.02382** |
| | **r=** | **0.99998** | | **r=** | **0.99998** |

**Calculations**

| | | | |
|---|---|---|---|
| **Vstd=** | ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta) | **Va=** | ΔVol((Pa-ΔP)/Pa) |
| **Qstd=** | Vstd/ΔTime | **Qa=** | Va/ΔTime |

**For subsequent flow rate calculations:**

**Qstd=** $1/m\left(\left(\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}\right)-b\right)$

**Qa=** $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

| Standard Conditions | |
|---|---|
| Tstd: | 298.15 °K |
| Pstd: | 760 mm Hg |

| Key |
|---|
| ΔH: calibrator manometer reading (in H2O) |
| ΔP: rootsmeter manometer reading (mm Hg) |
| Ta: actual absolute temperature (°K) |
| Pa: actual barometric pressure (mm Hg) |
| b: intercept |
| m: slope |

**RECALIBRATION**

US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30

Tisch Environmental, Inc.
145 South Miami Avenue
Village of Cleves, OH 45002

www.tisch-env.com
TOLL FREE: (877)263-7610
FAX: (513)467-9005

# *Certificate of Calibration*

*for*

| | |
|---|---|
| ***Description:*** | ***Sound Level Meter*** |
| ***Manufacturer:*** | ***RION*** |
| ***Type No.:*** | ***NL-52 (Serial No.: 00131627)*** |
| ***Microphone:*** | ***UC-59 (Serial No.: 04870)*** |
| ***Preamplifier:*** | ***NH-25 (Serial No.: 10403)*** |

***Submitted by:***

| | |
|---|---|
| *Customer:* | *Envirotech Services Co.* |
| *Address:* | *Rm.113, 1/F., My Loft, 9 Hoi Wing Road,* |
| | *Tuen Mun, Hong Kong* |

**Upon receipt for calibration, the instrument was found to be:**

☑ **Within (31.5Hz – 8kHz)**
☐ **Outside**

**the allowable tolerance.**

The test equipment used for calibration are traceable to National Standards via:
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory

**Date of receipt: 07 June 2023**

**Date of calibration: 08 June 2023**

**Date of NEXT calibration: 07 June 2024**

***Calibrated by:*** _____
*Calibration Technician*

***Certified by:*** _____
***Mr. Ng Yan Wa***
***Laboratory Manager***

***Date of issue:*** **08 June 2023**

*Certificate No.: APJ23-029-CC001*

ACOUSTICS AND AIR TESTING LABORATORY CO. LTD. (A+A)*L



Room 422,Leader Industrial Centre,57-59 Au Pui Wan Street ,Fo Tan, Shatin,N.T.,Hong Kong
Tel: (852) 2668 3423 Fax:(852) 2668 6946
Homepage: http://www.aa-lab.com E-mail : inquiry@aa-lab.com

## 1. *Calibration Precaution:*

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

- The results presented are the mean of 3 measurements at each calibration point.

## 2. *Calibration Conditions:*

| | |
|---|---|
| **Air Temperature:** | 22.5 °C |
| **Air Pressure:** | 1006 hPa |
| **Relative Humidity:** | 64.5 % |

## 3. *Calibration Equipment:*

| | Type | Serial No. | Calibration Report Number | Traceable to |
|---|---|---|---|---|
| **Multifunction Calibrator** | B&K 4226 | 2288467 | AV220061 | HOKLAS |

## 4. *Calibration Results*

Sound Pressure Level

Reference Sound Pressure Level

| Setting of Unit-under-test (UUT) | | | Applied value | | UUT Reading, dB | IEC 61672 Class 1 Specification, dB |
|---|---|---|---|---|---|---|
| Range, dB | Freq. Weighting | Time Weighting | Level, dB | Frequency, Hz | | |
| 30-130 | dBA SPL | Fast | 94 | 1000 | 94.0 | ±0.4 |

Linearity

| Setting of Unit-under-test (UUT) | | | Applied value | | UUT Reading, dB | IEC 61672 Class 1 Specification, dB |
|---|---|---|---|---|---|---|
| Range, dB | Freq. Weighting | Time Weighting | Level, dB | Frequency, Hz | | |
| 30-130 | dBA SPL | Fast | 94 | 1000 | 94.0 | Ref |
| | | | 104 | | 104.0 | ±0.3 |
| | | | 114 | | 114.0 | ±0.3 |

Time Weighting

| Setting of Unit-under-test (UUT) | | | Applied value | | UUT Reading, dB | IEC 61672 Class 1 Specification, dB |
|---|---|---|---|---|---|---|
| Range, dB | Freq. Weighting | Time Weighting | Level, dB | Frequency, Hz | | |
| 30-130 | dBA SPL | Fast | 94 | 1000 | 94.0 | Ref |
| | | Slow | | | 94.0 | ±0.3 |



Room 422,Leader Industrial Centre,57-59 Au Pui Wan Street ,Fo Tan, Shatin,N.T.,Hong Kong
Tel: (852) 2668 3423 Fax:(852) 2668 6946
Homepage: http://www.aa-lab.com E-mail : inquiry@aa-lab.com

Frequency Response

Linear Response

| Setting of Unit-under-test (UUT) | | | Applied value | | UUT Reading, | IEC 61672 Class 1 |
|---|---|---|---|---|---|---|
| Range, dB | Freq. Weighting | Time Weighting | Level, dB | Frequency, Hz | dB | Specification, dB |
| 30-130 | dB SPL | Fast | 94 | 31.5 | 93.9 | ±2.0 |
| | | | | 63 | 93.9 | ±1.5 |
| | | | | 125 | 94.0 | ±1.5 |
| | | | | 250 | 94.0 | ±1.4 |
| | | | | 500 | 94.0 | ±1.4 |
| | | | | 1000 | 94.0 | Ref |
| | | | | 2000 | 93.9 | ±1.6 |
| | | | | 4000 | 94.0 | ±1.6 |
| | | | | 8000 | 92.2 | +2.1; -3.1 |

A-weighting

| Setting of Unit-under-test (UUT) | | | Applied value | | UUT Reading, | IEC 61672 Class 1 |
|---|---|---|---|---|---|---|
| Range, dB | Freq. Weighting | Time Weighting | Level, dB | Frequency, Hz | dB | Specification, dB |
| 30-130 | dBA SPL | Fast | 94 | 31.5 | 54.4 | -39.4 ±2.0 |
| | | | | 63 | 67.7 | -26.2 ±1.5 |
| | | | | 125 | 77.9 | -16.1 ±1.5 |
| | | | | 250 | 85.3 | -8.6 ±1.4 |
| | | | | 500 | 90.7 | -3.2 ±1.4 |
| | | | | 1000 | 94.0 | Ref |
| | | | | 2000 | 95.1 | +1.2 ±1.6 |
| | | | | 4000 | 95.0 | +1.0 ±1.6 |
| | | | | 8000 | 91.2 | -1.1+2.1; -3.1 |

C-weighting

| Setting of Unit-under-test (UUT) | | | Applied value | | UUT Reading, | IEC 61672 Class 1 |
|---|---|---|---|---|---|---|
| Range, dB | Freq. Weighting | Time Weighting | Level, dB | Frequency, Hz | dB | Specification, dB |
| 30-130 | dBC SPL | Fast | 94 | 31.5 | 90.8 | -3.0 ±2.0 |
| | | | | 63 | 93.1 | -0.8 ±1.5 |
| | | | | 125 | 93.8 | -0.2 ±1.5 |
| | | | | 250 | 93.9 | -0.0 ±1.4 |
| | | | | 500 | 94.0 | -0.0 ±1.4 |
| | | | | 1000 | 94.0 | Ref |
| | | | | 2000 | 93.7 | -0.2 ±1.6 |
| | | | | 4000 | 93.2 | -0.8 ±1.6 |
| | | | | 8000 | 89.3 | –3.0 +2.1: –3.1 |



Room 422,Leader Industrial Centre,57-59 Au Pui Wan Street ,Fo Tan, Shatin,N.T.,Hong Kong
Tel: (852) 2668 3423 Fax:(852) 2668 6946
Homepage: http://www.aa-lab.com E-mail : inquiry@aa-lab.com

## 5. *Calibration Results Applied*

The results apply to the particular unit-under-test only. All calibration points are within manufacture's specification as IEC 61672 Class 1.

Uncertainties of Applied Value:

| | | |
|---|---|---|
| 94 dB | 31.5 Hz | ± 0.05 |
| | 63 Hz | ± 0.05 |
| | 125 Hz | ± 0.05 |
| | 250 Hz | ± 0.05 |
| | 500 Hz | ± 0.05 |
| | 1000 Hz | ± 0.05 |
| | 2000 Hz | ± 0.05 |
| | 4000 Hz | ± 0.05 |
| | 8000 Hz | ± 0.10 |
| 104 dB | 1000 Hz | ± 0.05 |
| 114 dB | 1000 Hz | ± 0.05 |

The uncertainties are evaluated for a 95% confidence level.

Note:
The values given in this certification only related to the values measured at the time of the calibration and any uncertainties quoted will not allow for the equipment long-term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the calibration. (A+A)*L shall not be liable for any loss or damage resulting from the use of the equipment.



Room 422,Leader Industrial Centre,57-59 Au Pui Wan Street ,Fo Tan, Shatin,N.T.,Hong Kong
Tel: (852) 2668 3423 Fax:(852) 2668 6946
Homepage: http://www.aa-lab.com E-mail : inquiry@aa-lab.com

輝創工程有限公司
Sun Creation Engineering Limited
Calibration & Testing Laboratory

# Certificate of Calibration
# 校正證書

Certificate No. : C234377
證書編號

**ITEM TESTED / 送檢項目** ( Job No. / 序引編號 : IC23-1403 ) Date of Receipt / 收件日期 : 11 July 2023

Description / 儀器名稱 : Precision Acoustic Calibrator
Manufacturer / 製造商 : LARSON DAVIS
Model No. / 型號 : CAL200
Serial No. / 編號 : 11333
Supplied By / 委託者 : Envirotech Services Co.
Room 712, 7/F, My Loft, 9 Hoi Wing Road, Tuen Mun,
New Territories, Hong Kong

**TEST CONDITIONS / 測試條件**

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (50 ± 25)%
Line Voltage / 電壓 : ---

**TEST SPECIFICATIONS / 測試規範**

Calibration check

**DATE OF TEST / 測試日期** : 30 July 2023

**TEST RESULTS / 測試結果**

The results apply to the particular unit-under-test only.
The results do not exceed specified limits.
These limits refer to manufacturer's published tolerances as requested by the customer.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Hottinger Brüel & Kjær Calibration Laboratory, Denmark
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By 測試 : H T Wong
Assistant Engineer

Certified By 核證 : K C Lee
Engineer

Date of Issue 簽發日期 : 31 July 2023



Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號四樓
Tel/電話: (852) 2927 2606 Fax/傳真: (852) 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

輝創工程有限公司
Sun Creation Engineering Limited
Calibration & Testing Laboratory

# Certificate of Calibration
# 校正證書

Certificate No. : C234377
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.

2. The results presented are the mean of 3 measurements at each calibration point.

3. Test equipment :

| Equipment ID | Description | Certificate No. |
|---|---|---|
| CL130 | Universal Counter | C233799 |
| CL281 | Multifunction Acoustic Calibrator | CDK2302738 |
| TST150A | Measuring Amplifier | C221750 |

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

| UUT Nominal Value | Measured Value (dB) | Mfr's Limit (dB) | Uncertainty of Measured Value (dB) |
|---|---|---|---|
| 94 dB, 1 kHz | 93.80 | ± 0.2 | ± 0.20 |
| 114 dB, 1 kHz | 113.80 | | |

5.2 Frequency Accuracy

| UUT Nominal Value (kHz) | Measured Value (kHz) | Mfr's Limit | Uncertainty of Measured Value (Hz) |
|---|---|---|---|
| 1 | 1.000 | 1 kHz ± 1 % | ± 1 |

Remark : The uncertainties are for a confidence probability of not less than 95 %.

Note :
Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.



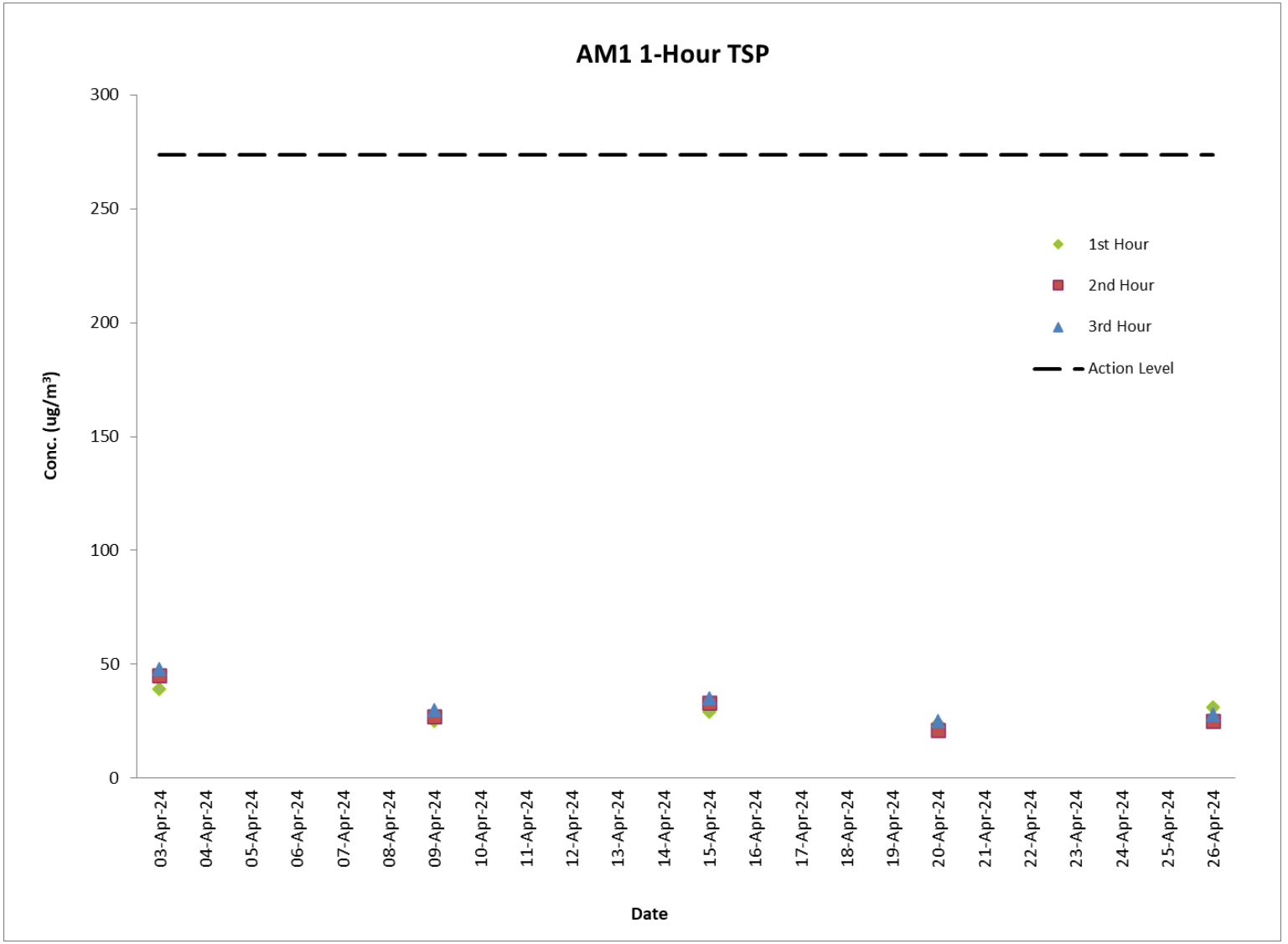
Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號四樓
Tel/電話: (852) 2927 2606 Fax/傳真: (852) 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

# G. Graphical Plots of the Monitoring Results

**Air Quality Monitoring Result at Station AM1 (1-hour TSP)**

| Date | Weather Condition | Time | Conc. (μg/m$^3$) | | | Action Level (μg/m$^3$) | Limit Level (μg/m$^3$) |
|---|---|---|---|---|---|---|---|
| | | | 1$^{st}$ Hour | 2$^{nd}$ Hour | 3$^{rd}$ Hour | | |
| 3-Apr-24 | Cloudy | 8:23 - 11:23 | 39 | 45 | 48 | 273.7 | 500 |
| 9-Apr-24 | Cloudy | 8:24 - 11:24 | 25 | 27 | 30 | 273.7 | 500 |
| 15-Apr-24 | Cloudy | 8:28 - 11:28 | 29 | 33 | 35 | 273.7 | 500 |
| 20-Apr-24 | Cloudy | 8:24 - 11:24 | 24 | 21 | 25 | 273.7 | 500 |
| 26-Apr-24 | Cloudy | 8:13 - 11:13 | 31 | 25 | 28 | 273.7 | 500 |

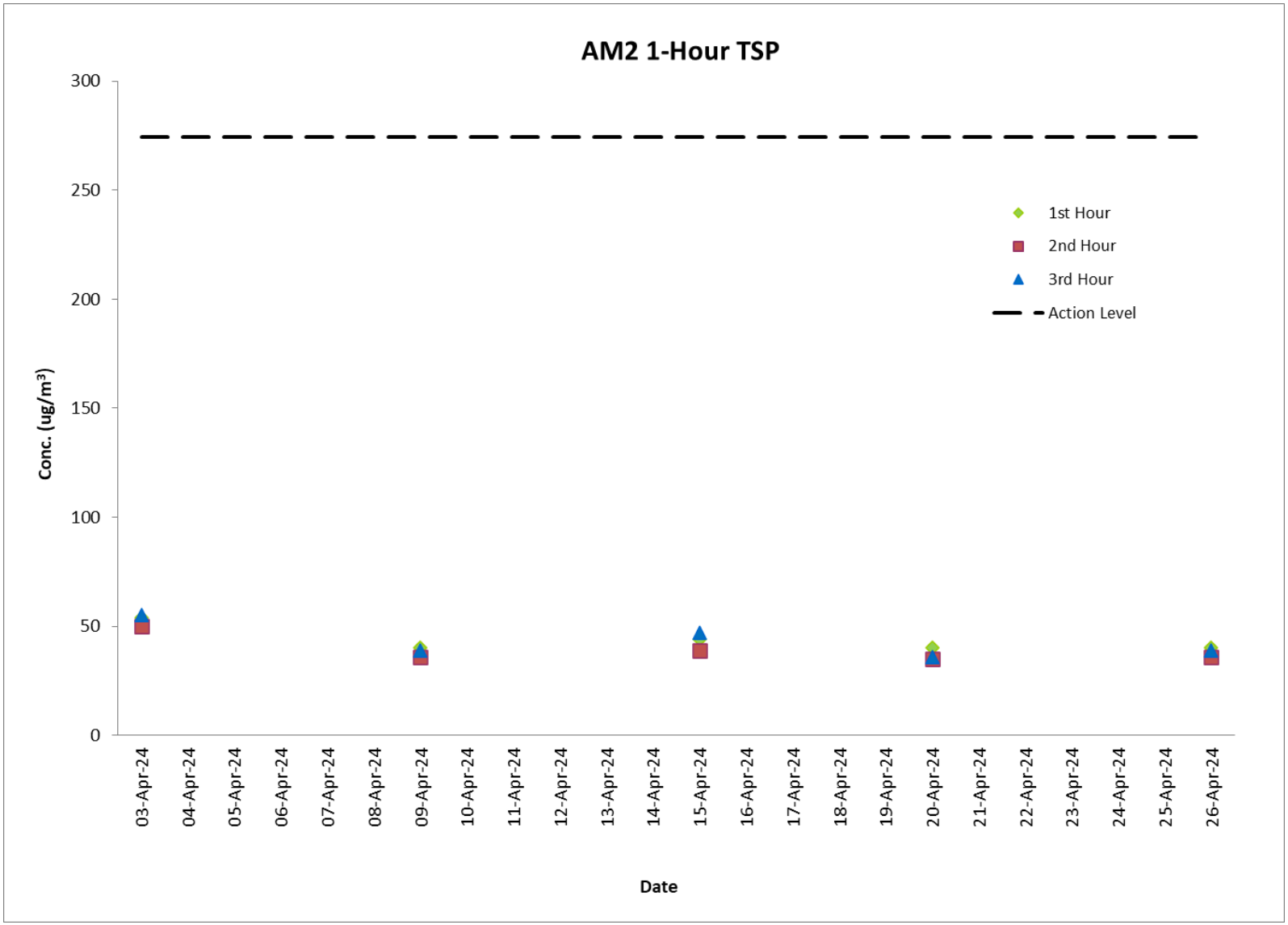
**Graphical Presentation of Air Quality Monitoring Result at Station AM1 (1-hour TSP)**



**Air Quality Monitoring Result at Station AM2 (1-hour TSP)**

| Date | Weather Condition | Time | Conc. (µg/m$^3$) | | | Action Level (µg/m$^3$) | Limit Level (µg/m$^3$) |
|---|---|---|---|---|---|---|---|
| | | | 1$^{st}$ Hour | 2$^{nd}$ Hour | 3$^{rd}$ Hour | | |
| 3-Apr-24 | Cloudy | 8:38 - 11:38 | 54 | 50 | 55 | 274.2 | 500 |
| 9-Apr-24 | Cloudy | 8:39 - 11:39 | 40 | 36 | 39 | 274.2 | 500 |
| 15-Apr-24 | Cloudy | 8:43 - 11:43 | 44 | 39 | 47 | 274.2 | 500 |
| 20-Apr-24 | Cloudy | 8:39 - 11:39 | 40 | 35 | 36 | 274.2 | 500 |
| 26-Apr-24 | Cloudy | 8:28 - 11:28 | 40 | 36 | 39 | 274.2 | 500 |

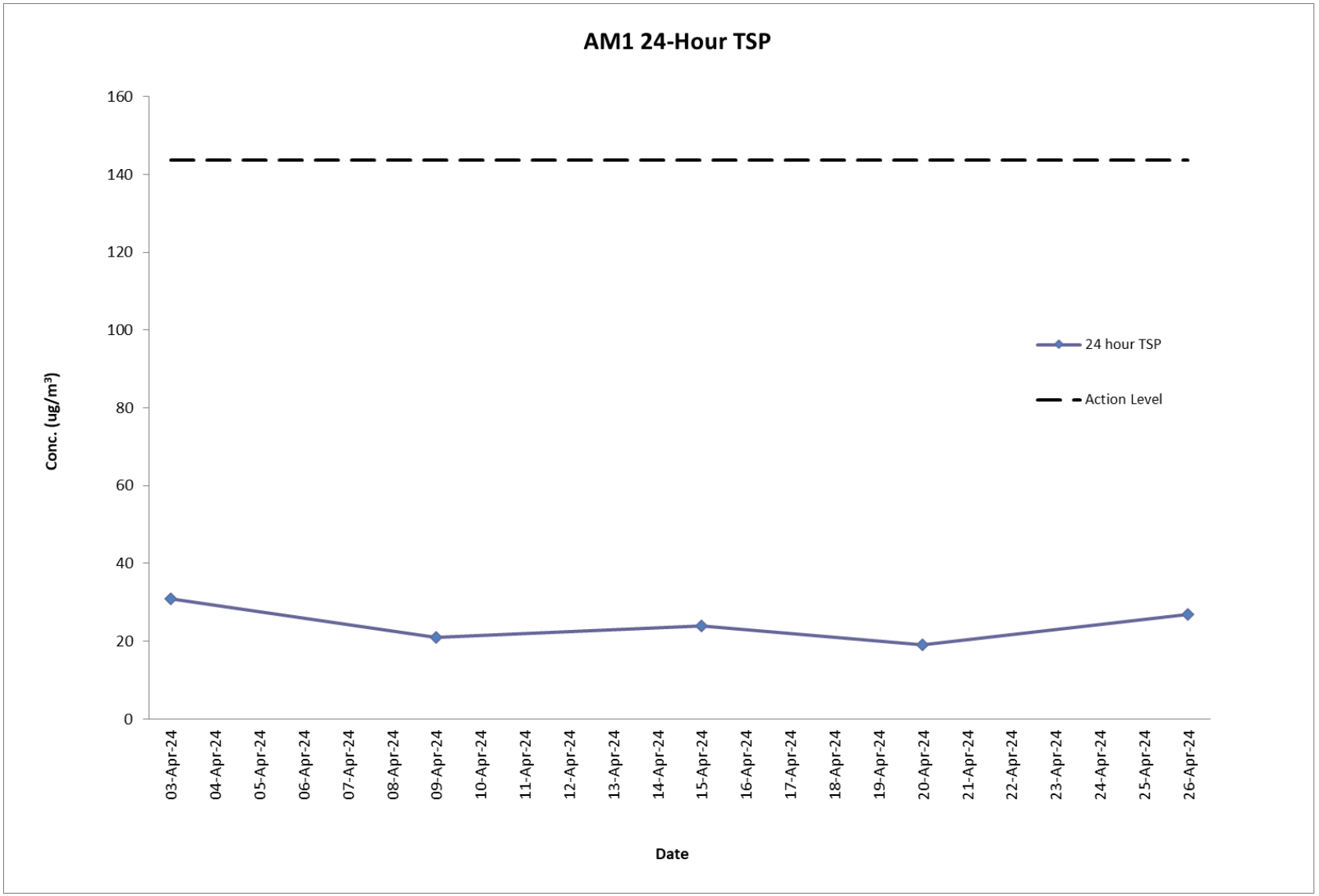
**Graphical Presentation of Air Quality Monitoring Result at Station AM2 (1-hour TSP)**



**Air Quality Monitoring Result at Station AM1 (24-hour TSP)**

| Start | | Finish | | Filter Weight (g) | | Elapsed Time Reading | | Sampling Time (hrs) | Flow Rate ($m^3$/min) | | | Conc. ($\mu g/m^3$) | Weather Condition | Action Level | Limit Level |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Time | Date | Time | Initial | Final | Initial | Final | | Initial | Final | Average | | | | |
| 3-Apr-24 | 8:21 | 4-Apr-24 | 8:21 | 2.8089 | 2.8648 | 27940.38 | 27964.38 | 24 | 1.24 | 1.24 | 1.24 | 31 | Cloudy | 143.6 | 260 |
| 9-Apr-24 | 8:21 | 10-Apr-24 | 8:21 | 2.8121 | 2.8502 | 27964.38 | 27988.38 | 24 | 1.24 | 1.24 | 1.24 | 21 | Cloudy | 143.6 | 260 |
| 15-Apr-24 | 8:25 | 16-Apr-24 | 8:25 | 2.8103 | 2.8524 | 27988.38 | 28012.38 | 24 | 1.24 | 1.24 | 1.24 | 24 | Cloudy | 143.6 | 260 |
| 20-Apr-24 | 8:21 | 21-Apr-24 | 8:21 | 2.8120 | 2.8464 | 28012.38 | 28036.38 | 24 | 1.24 | 1.24 | 1.24 | 19 | Cloudy | 143.6 | 260 |
| 26-Apr-24 | 8:10 | 27-Apr-24 | 8:10 | 2.8012 | 2.8499 | 28036.38 | 28060.38 | 24 | 1.24 | 1.24 | 1.24 | 27 | Cloudy | 143.6 | 260 |

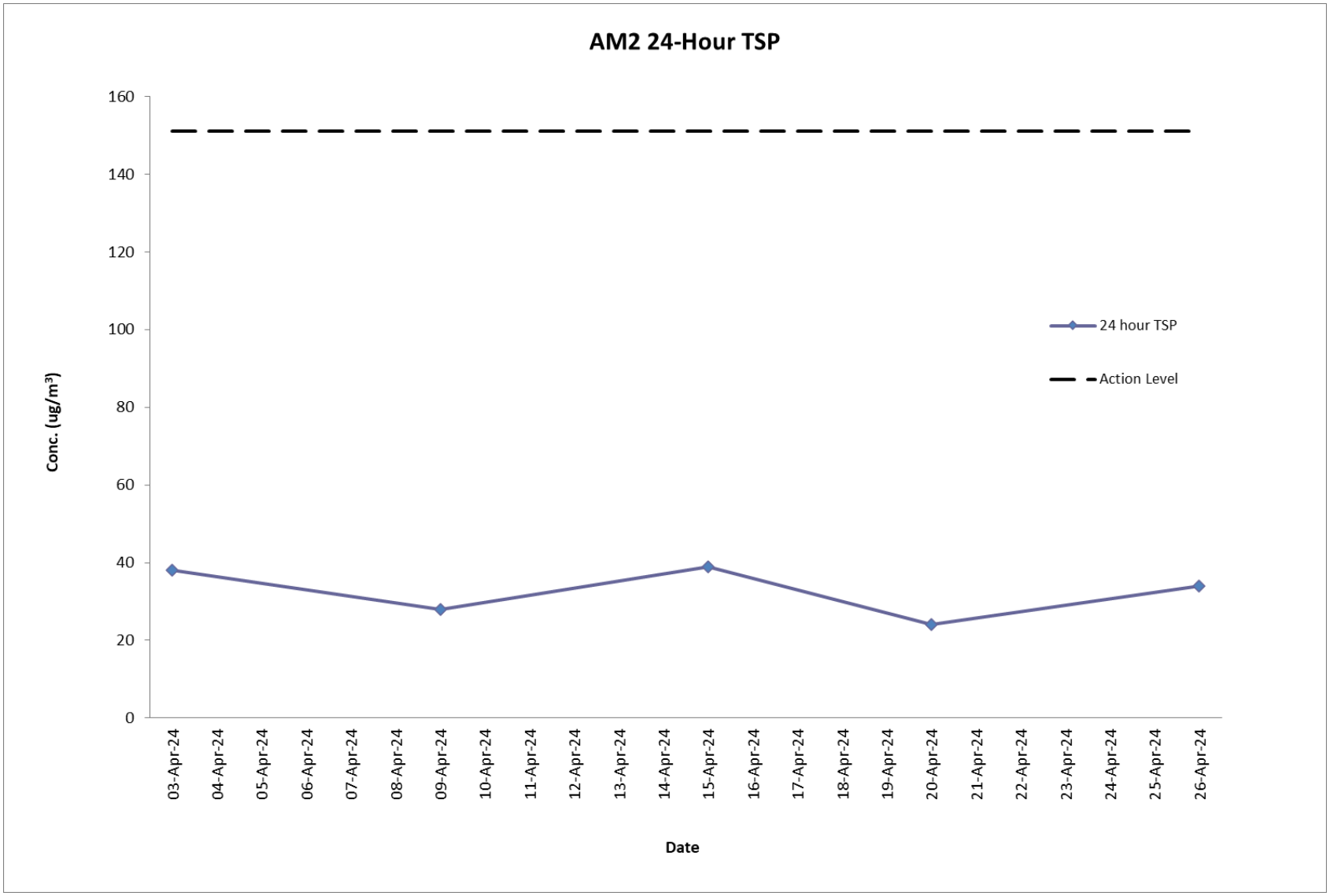
**Graphical Presentation of Air Quality Monitoring Result at Station AM1 (24-hour TSP)**



**Air Quality Monitoring Result at Station AM2 (24-hour TSP)**

| Start | | Finish | | Sampling Time (hrs) | Conc. ($\mu g/m^3$) | Weather Condition | Action Level | Limit Level |
|---|---|---|---|---|---|---|---|---|
| Date | Time | Date | Time | | | | | |
| 3-Apr-24 | 8:35 | 4-Apr-24 | 8:35 | 24 | 38 | Cloudy | 151.1 | 260 |
| 9-Apr-24 | 8:36 | 10-Apr-24 | 8:36 | 24 | 28 | Cloudy | 151.1 | 260 |
| 15-Apr-24 | 8:40 | 16-Apr-24 | 8:40 | 24 | 39 | Cloudy | 151.1 | 260 |
| 20-Apr-24 | 8:36 | 21-Apr-24 | 8:36 | 24 | 24 | Cloudy | 151.1 | 260 |
| 26-Apr-24 | 8:25 | 27-Apr-24 | 8:25 | 24 | 34 | Cloudy | 151.1 | 260 |

**Graphical Presentation of Air Quality Monitoring Result at Station AM2 (24-hour TSP)**



**Noise Monitoring Result at Station NM1A**

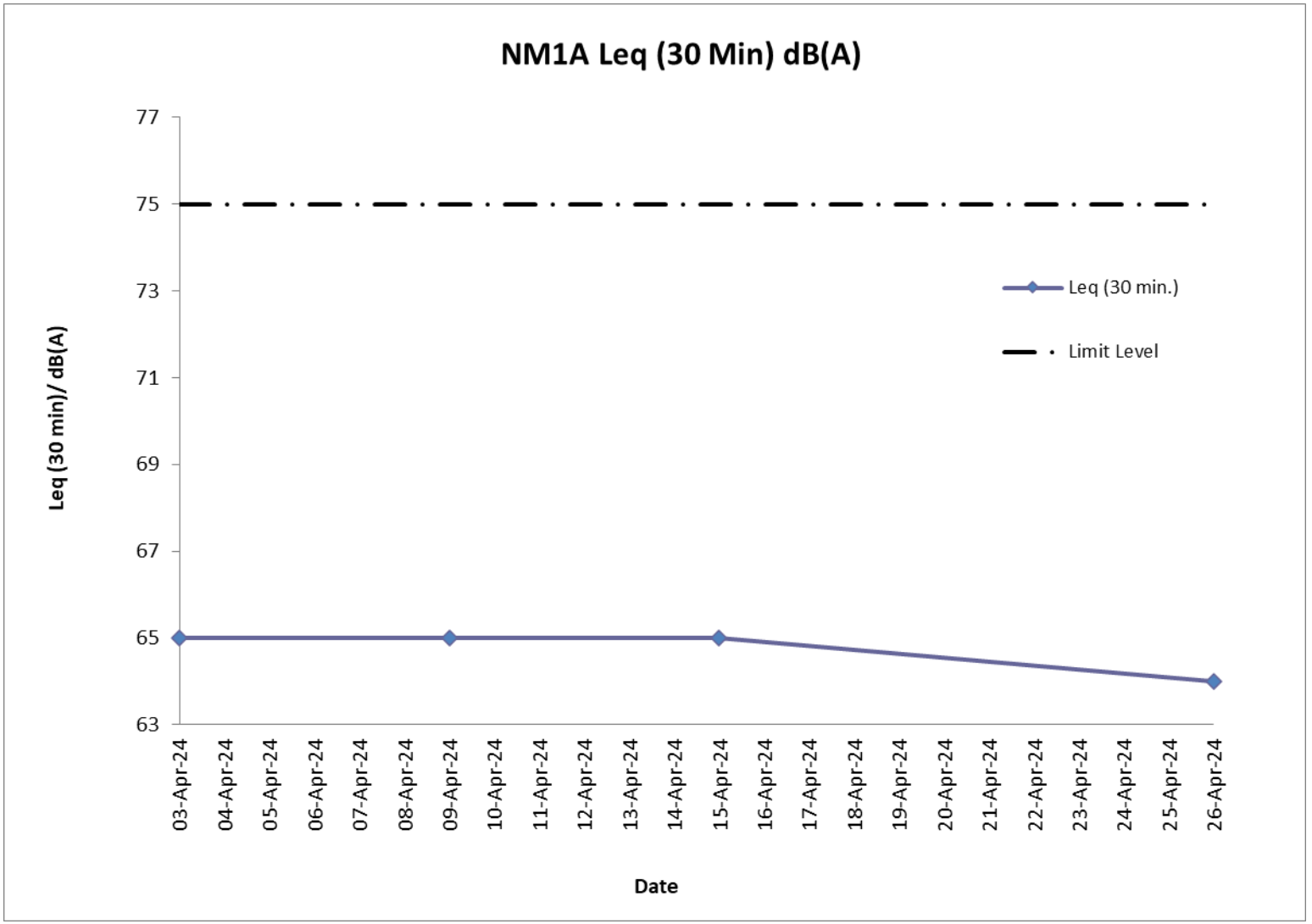
| Date | Time | Measured $L_{10}$, dB(A) | Measured $L_{90}$, dB(A) | $L_{eq}$ (30 min.)*, dB(A) |
|---|---|---|---|---|
| 3-Apr-24 | 9:21 | 63.5 | 59.3 | 65 |
| 3-Apr-24 | 9:26 | 64.2 | 60.9 | |
| 3-Apr-24 | 9:31 | 63.7 | 59.6 | |
| 3-Apr-24 | 9:36 | 64.0 | 60.7 | |
| 3-Apr-24 | 9:41 | 64.9 | 60.5 | |
| 3-Apr-24 | 9:46 | 65.2 | 61.0 | |
| 9-Apr-24 | 9:22 | 64.0 | 60.3 | 65 |
| 9-Apr-24 | 9:27 | 63.2 | 59.4 | |
| 9-Apr-24 | 9:32 | 62.5 | 58.8 | |
| 9-Apr-24 | 9:37 | 64.7 | 60.0 | |
| 9-Apr-24 | 9:42 | 65.9 | 61.7 | |
| 9-Apr-24 | 9:47 | 63.4 | 59.5 | |
| 15-Apr-24 | 9:27 | 64.0 | 60.7 | 65 |
| 15-Apr-24 | 9:32 | 65.2 | 61.3 | |
| 15-Apr-24 | 9:37 | 63.4 | 59.5 | |
| 15-Apr-24 | 9:42 | 63.7 | 59.8 | |
| 15-Apr-24 | 9:47 | 64.9 | 60.6 | |
| 15-Apr-24 | 9:52 | 63.8 | 59.0 | |
| 26-Apr-24 | 9:11 | 62.3 | 58.0 | 64 |
| 26-Apr-24 | 9:16 | 63.5 | 59.9 | |
| 26-Apr-24 | 9:21 | 61.7 | 57.9 | |
| 26-Apr-24 | 9:26 | 62.2 | 58.7 | |
| 26-Apr-24 | 9:31 | 63.0 | 59.1 | |
| 26-Apr-24 | 9:36 | 64.9 | 60.2 | |

**Remarks:**

* +3dB (A) correction was applied to free-field measurement.

The station set-up of a free-field measurement at Station NM1A.

**Graphical Presentation Noise Monitoring Result at Station NM1A**

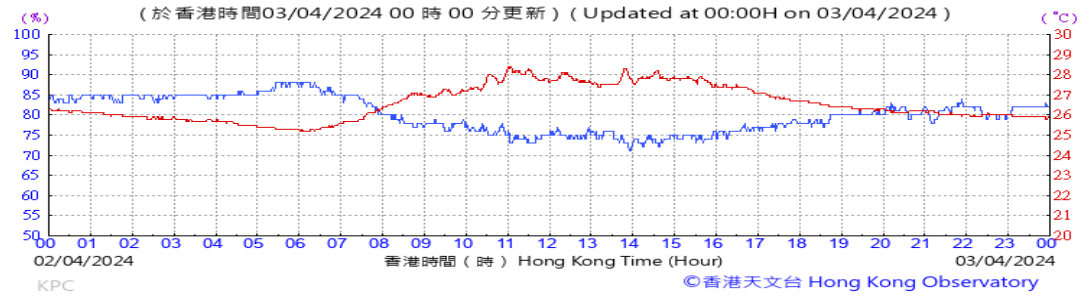


# H. Meteorological Data Extracted from Hong Kong Observatory

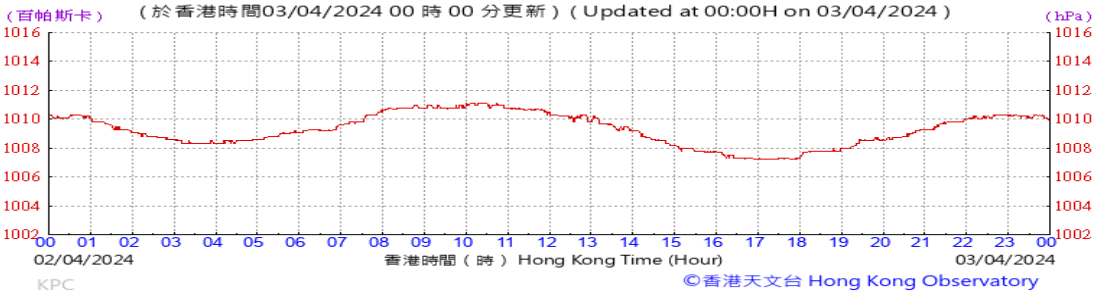
**Extract of Meteorological Observations for King's Park Automatic Weather Station**

**April 2024**

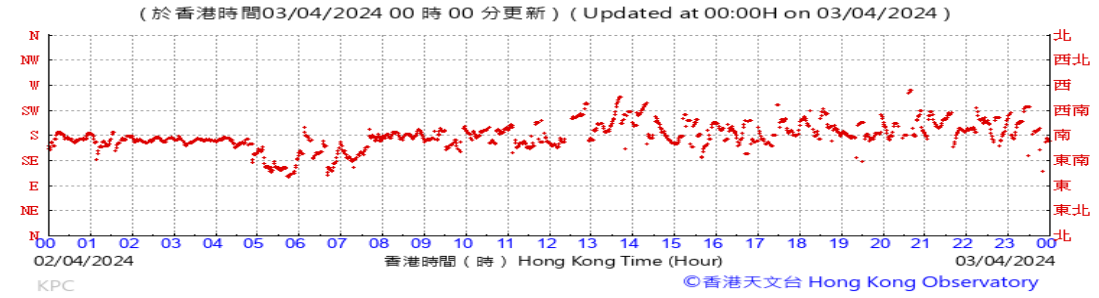
Temperature/Humidity:



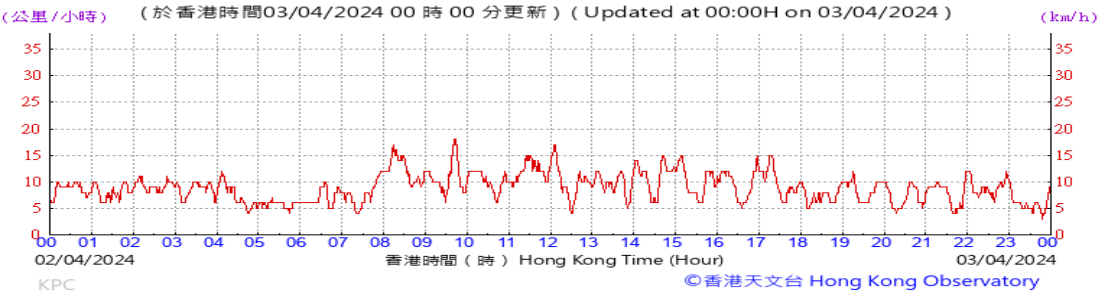

Pressure:



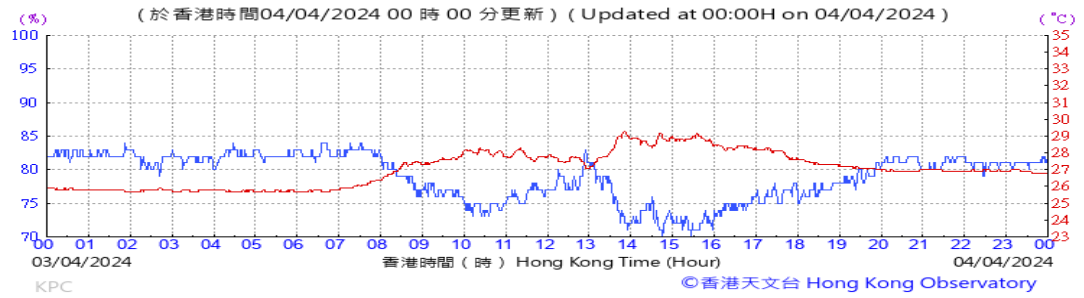

Wind Direction:



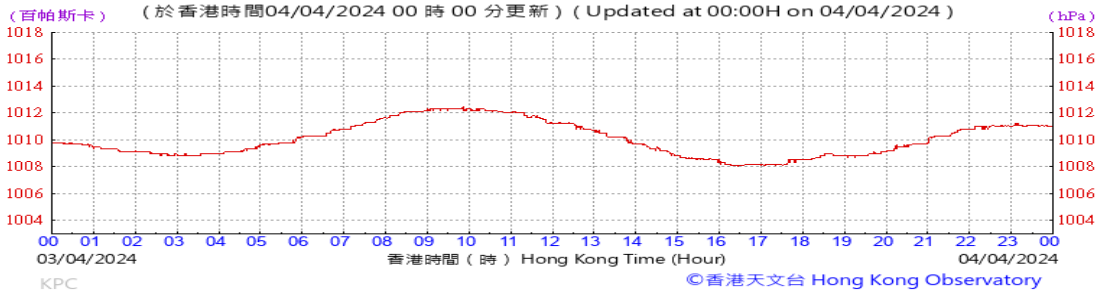

Wind Speed:



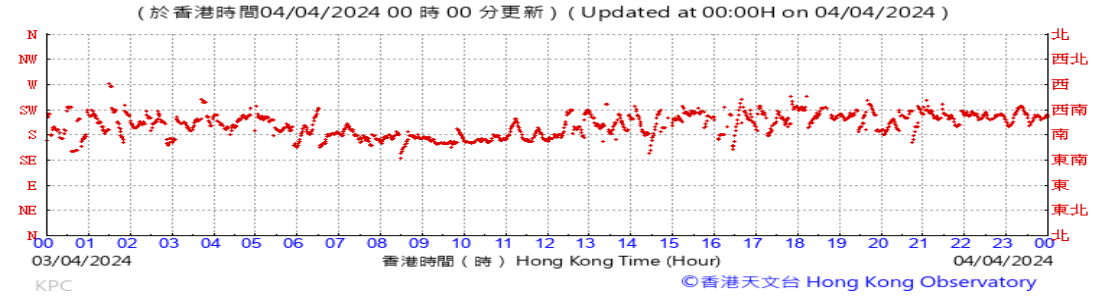
Temperature/Humidity:



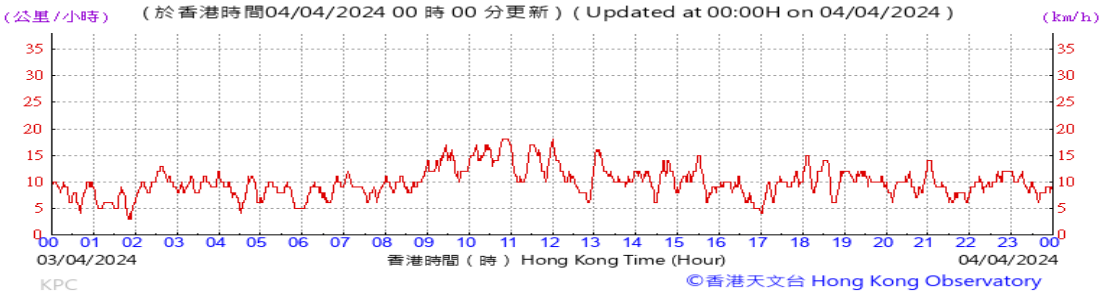

Pressure:



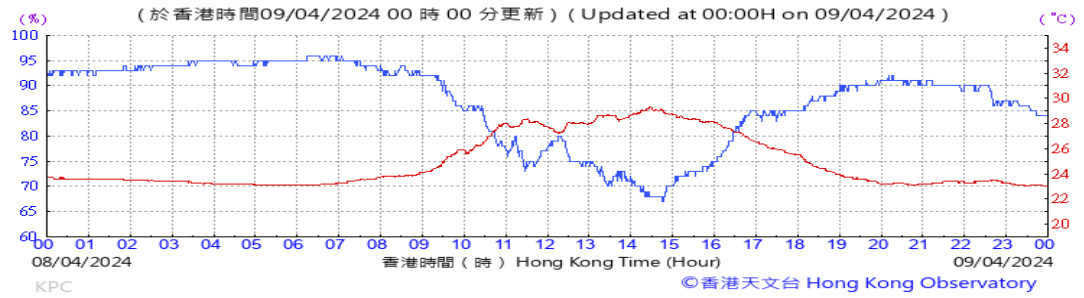

Wind Direction:



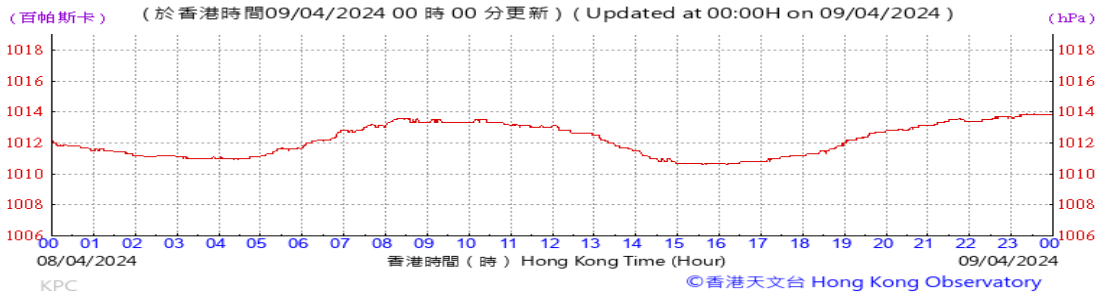

Wind Speed:



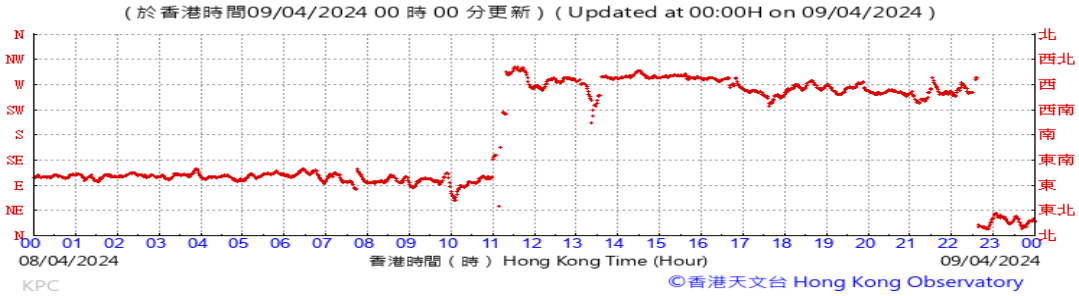
Temperature/Humidity:




Pressure:

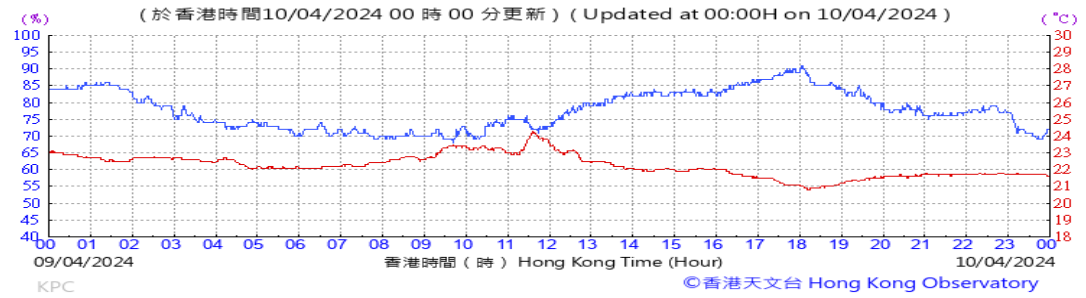



Wind Direction:

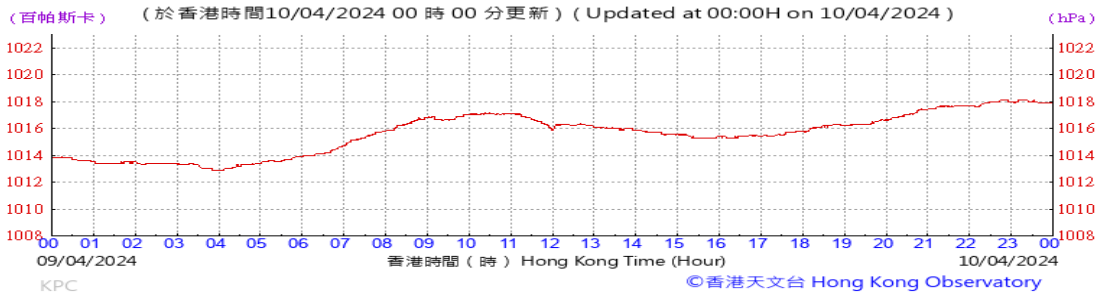



Wind Speed:

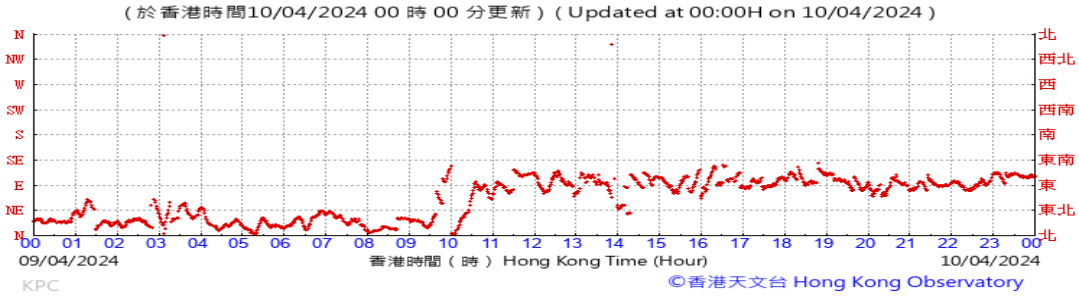
Temperature/Humidity:



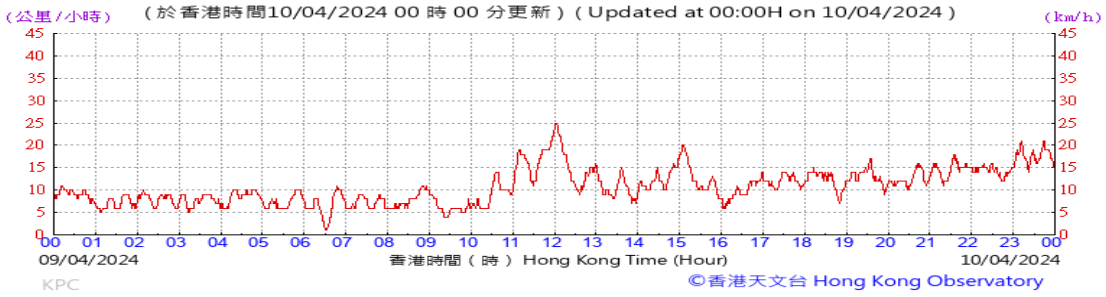

Pressure:



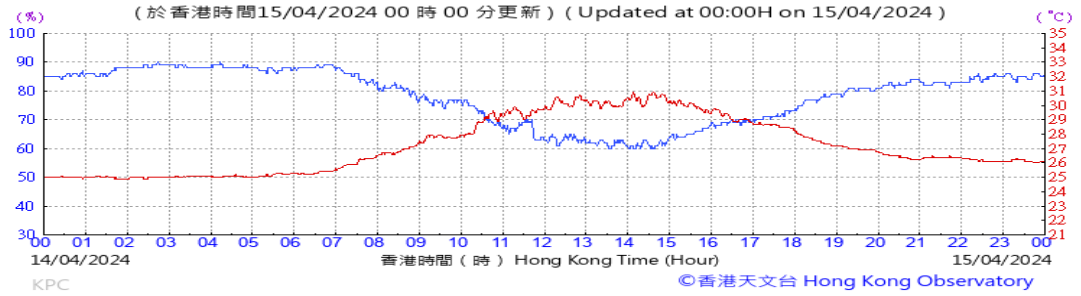

Wind Direction:



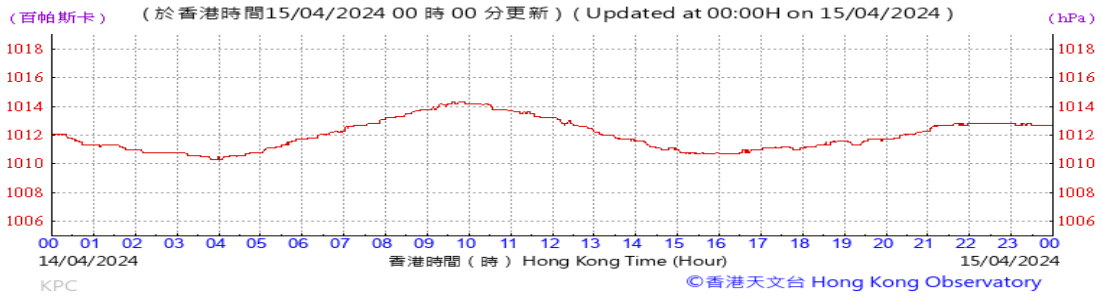

Wind Speed:



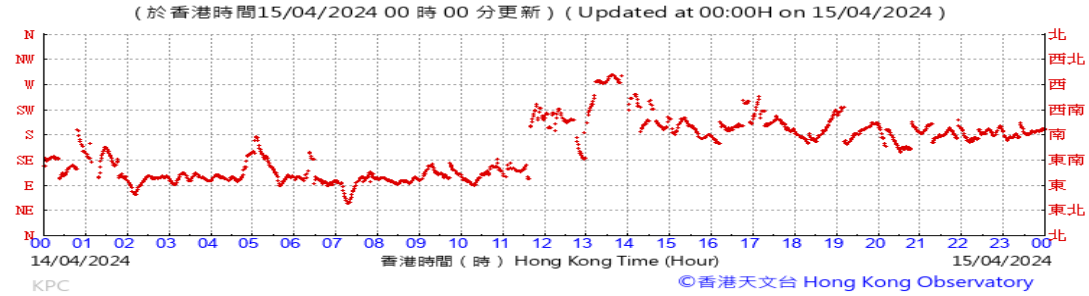
Temperature/Humidity:



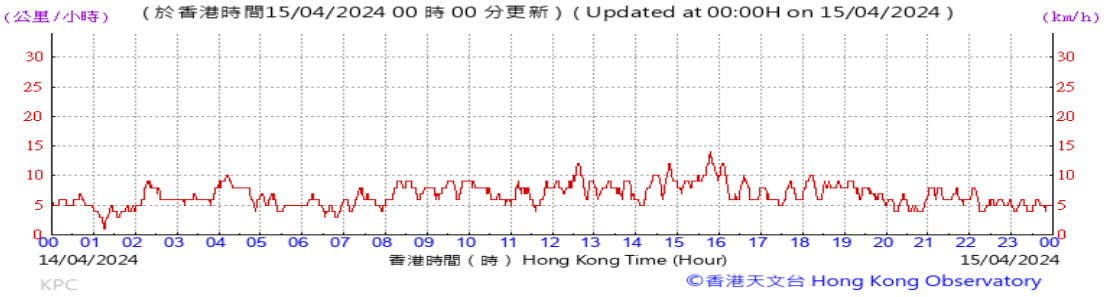

Pressure:




Wind Direction:

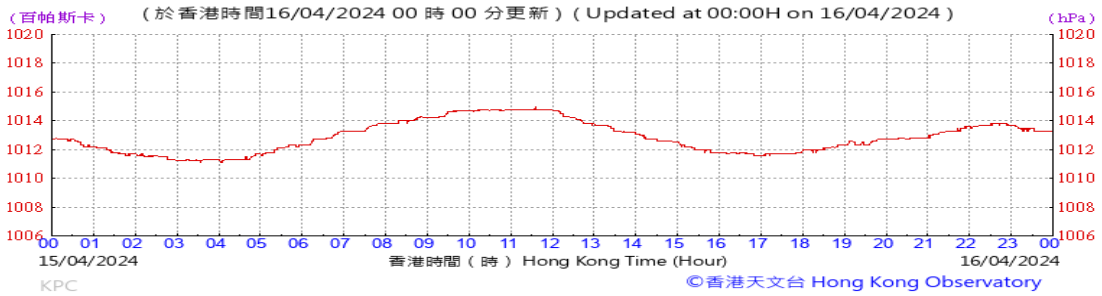



Wind Speed:

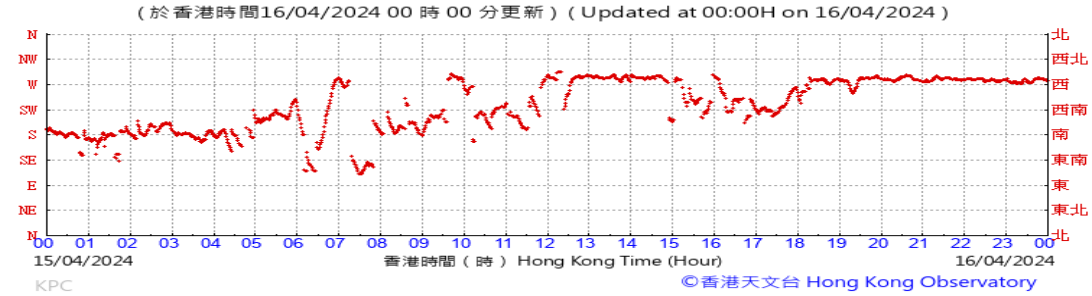


Temperature/Humidity:

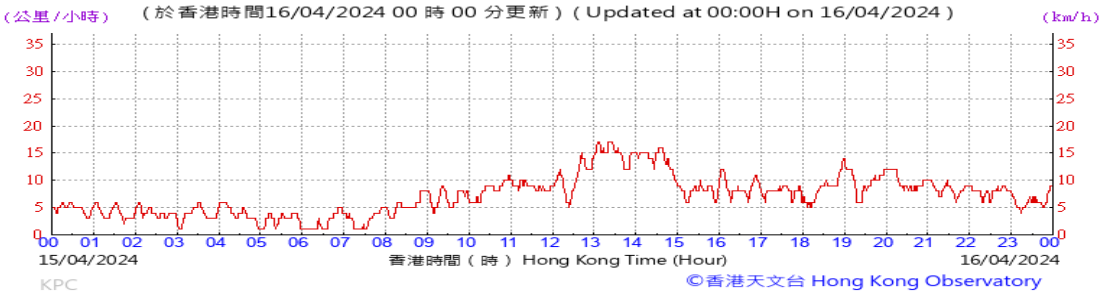

Pressure:



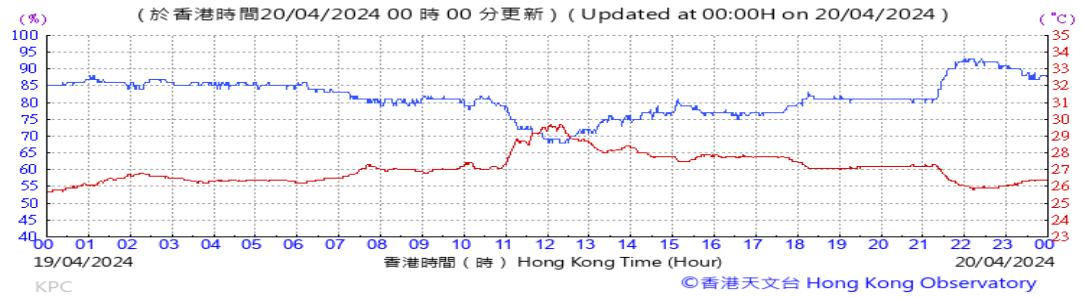

Wind Direction:




Wind Speed:

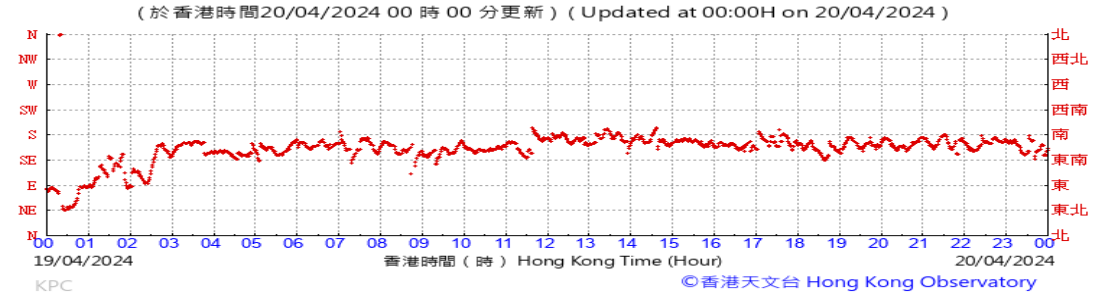


Temperature/Humidity:

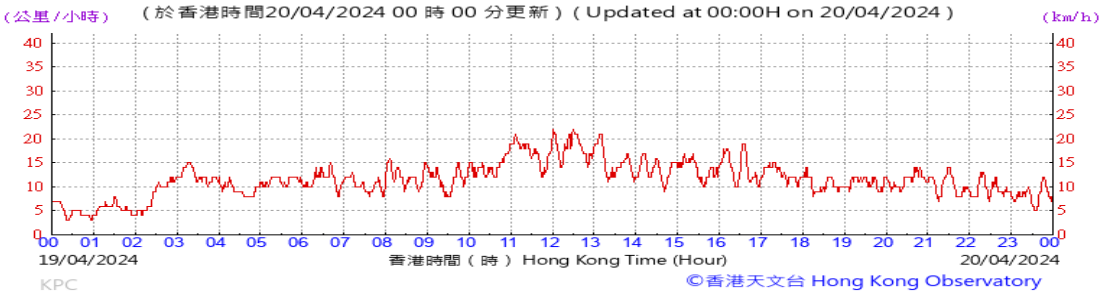



Pressure:

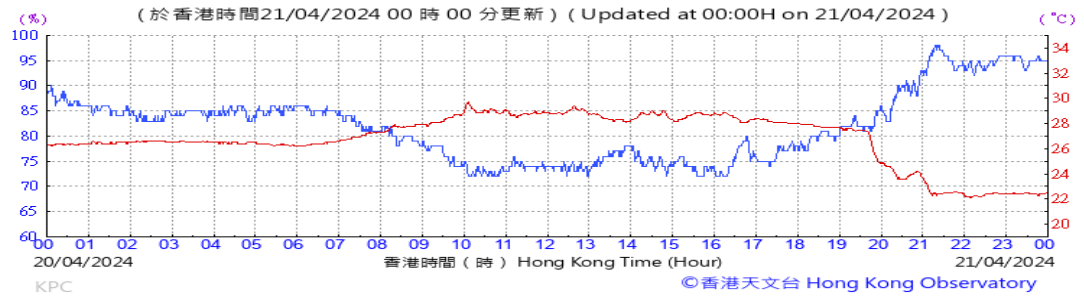

Wind Direction:



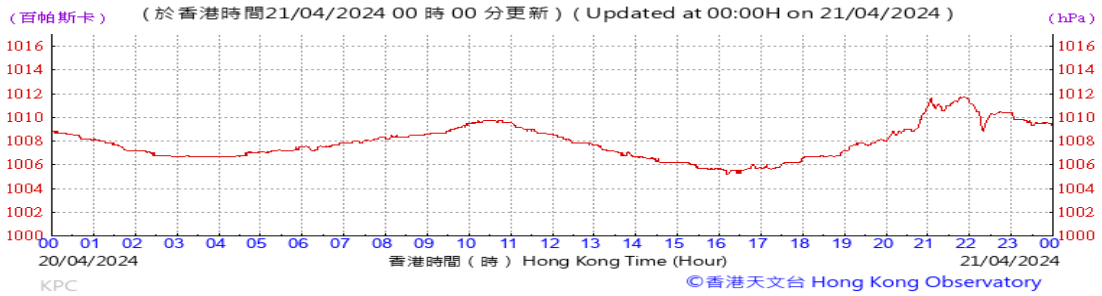

Wind Speed:



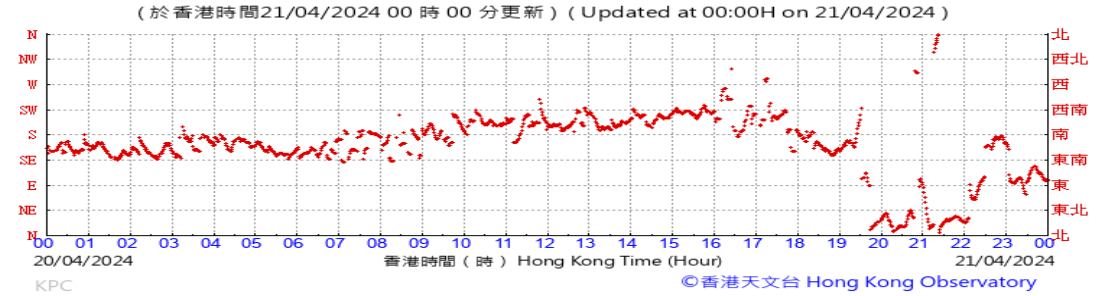
Temperature/Humidity:




Pressure:

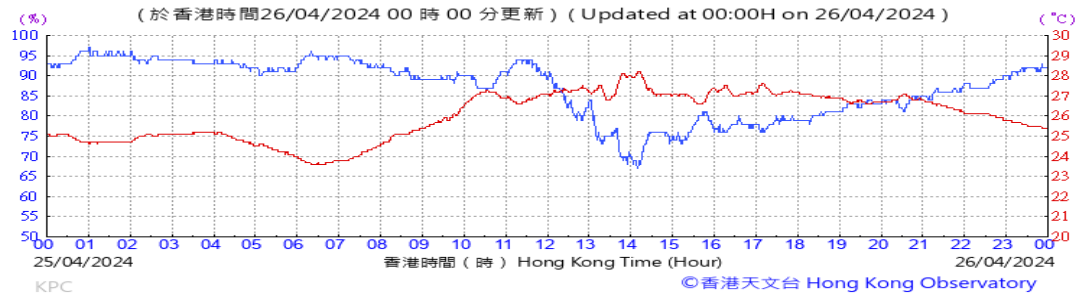



Wind Direction:

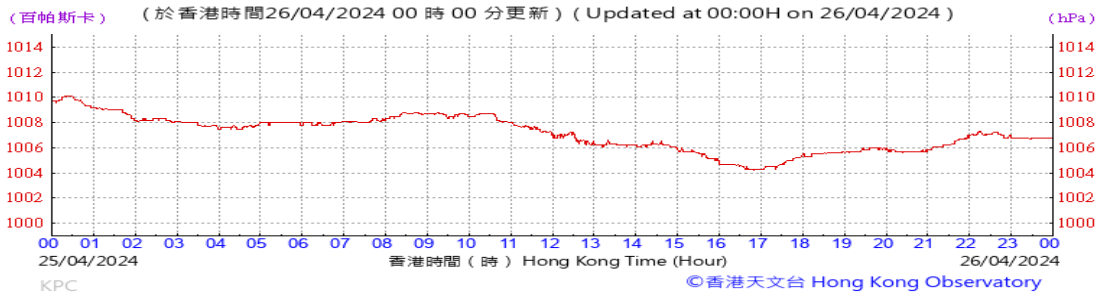



Wind Speed:

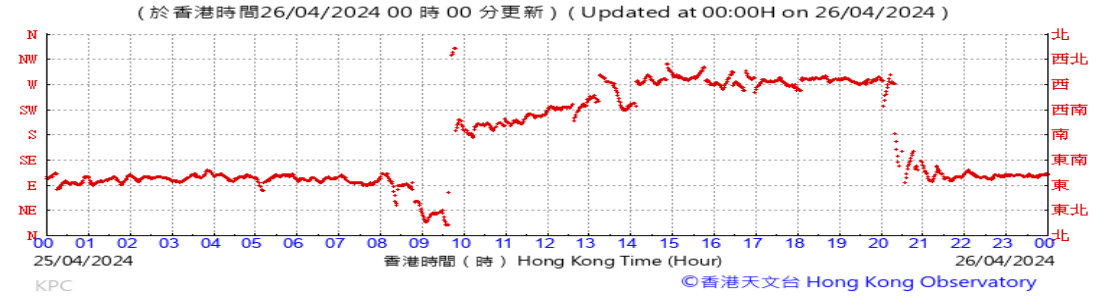
Temperature/Humidity:




Pressure:

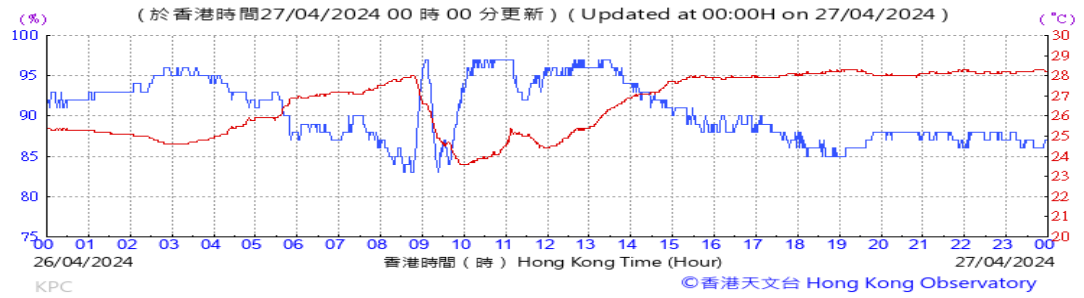



Wind Direction:



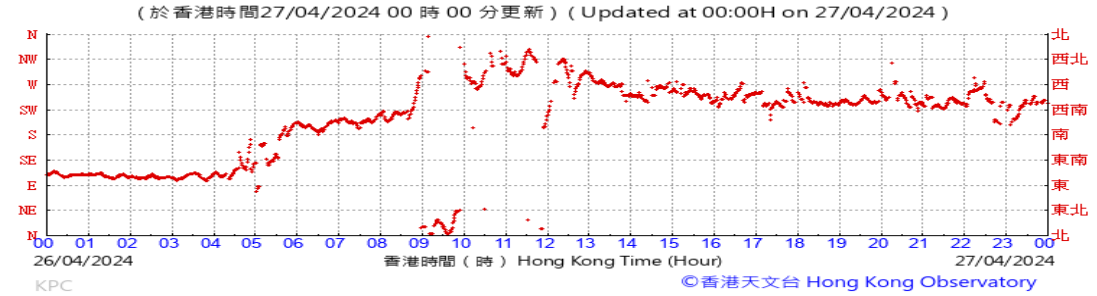

Wind Speed:

Temperature/Humidity:




Pressure:


Wind Direction:




Wind Speed:

# I. Waste Flow table

**Table I-1: Monthly Waste Flow Table for Lyric Theatre Complex**

| Month | Actual Quantities of Inert C&D Materials Generated Monthly | | | | | | | Actual Quantities of C&D Wastes Generated Monthly | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Quantity Generated | Hard Rocks and Large Broken Concrete | Reused in the Contract | Reused in other Projects | Disposed as Public Fill | Disposed to Sorting Facilty | Imported Fill | Metals | Paper/ Cardboard Packaging | Plastics | Wood/ Timber | Chemical Waste | Others, e.g. General Refuse |
| | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) |
| **2016** | | | | | | | | | | | | | |
| Mar | 2702.1 | 0.0 | 0.0 | 0.0 | 2702.1 | 0.0 | 0.0 | 4.5 | 0.1 | 0.0 | 0.0 | 0.0 | 30.6 |
| Apr | 8631.5 | 0.0 | 0.0 | 0.0 | 8631.5 | 0.0 | 0.0 | 16.0 | 0.0 | 0.0 | 0.0 | 0.0 | 19.2 |
| May | 12487.8 | 0.0 | 0.0 | 0.0 | 12487.8 | 0.0 | 0.0 | 34.0 | 0.0 | 0.0 | 0.0 | 0.7 | 60.5 |
| Jun | 8600.8 | 0.0 | 0.0 | 0.0 | 8600.8 | 0.0 | 0.0 | 31.4 | 0.2 | 0.0 | 0.0 | 0.5 | 13.5 |
| Jul | 12624.2 | 0.0 | 0.0 | 0.0 | 12624.2 | 0.0 | 0.0 | 19.6 | 0.0 | 0.0 | 0.0 | 2.0 | 9.9 |
| Aug | 14419.9 | 0.0 | 0.0 | 0.0 | 14419.9 | 0.0 | 0.0 | 43.9 | 0.0 | 0.0 | 0.0 | 0.0 | 11.1 |
| Sep | 13671.3 | 0.0 | 0.0 | 0.0 | 13671.3 | 0.0 | 0.0 | 59.8 | 0.0 | 0.0 | 0.0 | 1.6 | 12.4 |
| Oct | 13088.9 | 0.0 | 0.0 | 0.0 | 13088.9 | 0.0 | 0.0 | 36.9 | 0.2 | 1.5 | 0.0 | 0.0 | 15.2 |
| Nov | 12424.7 | 0.0 | 0.0 | 0.0 | 12424.7 | 0.0 | 0.0 | 74.7 | 0.0 | 0.0 | 0.0 | 1.4 | 10.2 |
| Dec | 12487.6 | 0.0 | 0.0 | 0.0 | 12487.6 | 0.0 | 0.0 | 13.9 | 0.0 | 0.0 | 0.0 | 1.3 | 9.0 |
| Sub-total (2016) | 111138.8 | 0.0 | 0.0 | 0.0 | 111138.8 | 0.0 | 0.0 | 334.5 | 0.4 | 1.5 | 0.0 | 7.6 | 191.6 |
| **2017** | | | | | | | | | | | | | |
| Jan | 9607.8 | 0.0 | 0.0 | 0.0 | 9607.8 | 0.0 | 0.0 | 29.5 | 0.0 | 0.0 | 0.0 | 0.0 | 7.3 |
| Feb | 9108.2 | 0.0 | 0.0 | 0.0 | 9108.2 | 0.0 | 0.0 | 50.2 | 0.2 | 0.0 | 0.0 | 0.7 | 9.8 |
| Mar | 11361.7 | 0.0 | 0.0 | 0.0 | 11361.7 | 0.0 | 0.0 | 16.1 | 0.0 | 0.0 | 0.0 | 1.4 | 8.5 |
| Apr | 2591.5 | 0.0 | 0.0 | 0.0 | 2591.5 | 0.0 | 0.0 | 35.7 | 0.0 | 0.0 | 0.0 | 0.0 | 4.7 |
| May | 2579.3 | 0.0 | 0.0 | 99.0 | 2480.3 | 0.0 | 0.0 | 20.9 | 0.1 | 0.0 | 0.0 | 0.5 | 10.0 |
| Jun | 476.0 | 0.0 | 0.0 | 341.0 | 129.7 | 5.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 7.6 |
| Jul | 3419.0 | 0.0 | 0.0 | 804.0 | 2615.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 17.8 |
| Aug | 3730.9 | 0.0 | 0.0 | 1377.5 | 2353.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.4 |
| Sep | 2108.2 | 0.0 | 0.0 | 1133.5 | 974.7 | 0.0 | 0.0 | 34.6 | 0.2 | 0.0 | 0.0 | 0.0 | 10.8 |
| Oct | 9159.0 | 0.0 | 0.0 | 7868.0 | 1291.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 | 9.3 |
| Nov | 5095.4 | 0.0 | 0.0 | 4352.0 | 725.2 | 18.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 38.8 |
| Dec | 3856.2 | 0.0 | 0.0 | 3076.0 | 780.2 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.4 | 8.4 |
| Sub-total (2017) | 63093.1 | 0.0 | 0.0 | 19051.0 | 44018.7 | 23.4 | 0.0 | 187.1 | 0.7 | 0.0 | 0.0 | 3.8 | 137.3 |

**Table I-1: Monthly Waste Flow Table for Lyric Theatre Complex**

| Month | Actual Quantities of Inert C&D Materials Generated Monthly | | | | | | | Actual Quantities of C&D Wastes Generated Monthly | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Quantity Generated | Hard Rocks and Large Broken Concrete | Reused in the Contract | Reused in other Projects | Disposed as Public Fill | Disposed to Sorting Facilty | Imported Fill | Metals | Paper/ Cardboard Packaging | Plastics | Wood/ Timber | Chemical Waste | Others, e.g. General Refuse |
| | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) |
| **2018** | | | | | | | | | | | | | |
| Jan | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Feb | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.5 |
| Mar | 6120.2 | 0.0 | 0.0 | 5782.0 | 338.2 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.5 | 17.6 |
| Apr | 14460.3 | 0.0 | 0.0 | 12484.1 | 1976.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 7.6 |
| May | 59783.7 | 0.0 | 0.0 | 46989.0 | 12794.7 | 0.0 | 0.0 | 59.6 | 0.0 | 0.0 | 0.0 | 0.0 | 9.4 |
| Jun | 53117.5 | 0.0 | 0.0 | 37642.8 | 15474.7 | 0.0 | 0.0 | 51.5 | 0.2 | 0.0 | 0.0 | 0.0 | 12.8 |
| Jul | 89901.5 | 0.0 | 0.0 | 85317.1 | 4584.4 | 0.0 | 165.1 | 114.6 | 0.0 | 0.0 | 0.0 | 0.0 | 41.3 |
| Aug | 35137.3 | 0.0 | 0.0 | 33731.6 | 1405.7 | 0.0 | 214.3 | 148.1 | 0.0 | 0.0 | 0.0 | 0.0 | 48.5 |
| Sep | 4924.3 | 0.0 | 0.0 | 4641.2 | 196.1 | 87.0 | 174.6 | 40.0 | 0.0 | 0.0 | 0.0 | 0.0 | 179.2 |
| Oct | 19099.9 | 0.0 | 0.0 | 11301.0 | 7642.8 | 156.1 | 0.0 | 106.3 | 0.4 | 0.0 | 0.0 | 0.0 | 528.5 |
| Nov | 104168.0 | 0.0 | 0.0 | 79811.6 | 24351.0 | 5.3 | 0.0 | 54.5 | 0.0 | 0.6 | 0.0 | 0.0 | 31.5 |
| Dec | 62989.9 | 0.0 | 0.0 | 51284.4 | 11699.9 | 5.6 | 0.0 | 95.1 | 0.0 | 0.6 | 0.0 | 0.0 | 65.9 |
| Sub-total (2018) | 449702.6 | 0.0 | 0.0 | 368984.8 | 80463.7 | 254.0 | 553.9 | 669.7 | 0.5 | 2.4 | 0.0 | 0.5 | 943.7 |
| **2019** | | | | | | | | | | | | | |
| Jan | 74479.1 | 0.0 | 0.0 | 69249.5 | 5229.7 | 0.0 | 318.0 | 326.7 | 0.2 | 0.0 | 0.0 | 0.0 | 76.3 |
| Feb | 21969.9 | 0.0 | 0.0 | 17723.9 | 4246.0 | 0.0 | 16.5 | 55.2 | 0.0 | 0.0 | 0.0 | 0.0 | 26.7 |
| Mar | 19311.9 | 0.0 | 0.0 | 8569.9 | 10742.0 | 0.0 | 337.8 | 61.5 | 0.0 | 0.0 | 0.0 | 0.0 | 36.3 |
| Apr | 28559.9 | 0.0 | 0.0 | 21280.3 | 7279.6 | 0.0 | 0.0 | 32.6 | 0.0 | 0.8 | 0.0 | 0.0 | 24.9 |
| May | 45418.0 | 0.0 | 0.0 | 11200.6 | 34217.4 | 0.0 | 0.0 | 27.4 | 0.2 | 0.5 | 0.0 | 0.0 | 33.7 |
| Jun | 66633.4 | 0.0 | 0.0 | 23874.5 | 42748.0 | 10.9 | 59.2 | 11.9 | 0.0 | 0.9 | 0.0 | 0.0 | 35.3 |
| Jul | 36619.6 | 0.0 | 0.0 | 1632.7 | 34960.9 | 26.0 | 64.4 | 120.7 | 0.0 | 0.0 | 0.0 | 0.0 | 57.9 |
| Aug | 2526.8 | 0.0 | 0.0 | 0.0 | 2499.0 | 27.8 | 31.9 | 40.2 | 0.0 | 0.8 | 0.0 | 0.0 | 66.3 |
| Sep | 4117.6 | 0.0 | 0.0 | 0.0 | 4088.7 | 28.9 | 95.2 | 19.0 | 0.0 | 0.6 | 0.0 | 0.0 | 127.4 |
| Oct | 6974.2 | 0.0 | 0.0 | 0.0 | 6948.1 | 26.1 | 15.9 | 11.4 | 0.2 | 1.0 | 0.0 | 0.6 | 223.6 |
| Nov | 5334.4 | 0.0 | 0.0 | 0.0 | 5304.1 | 30.3 | 0.0 | 8.9 | 0.0 | 0.0 | 0.0 | 0.0 | 151.6 |
| Dec | 6236.8 | 0.0 | 0.0 | 0.0 | 6236.8 | 0.0 | 0.0 | 70.6 | 0.0 | 0.0 | 0.0 | 0.0 | 98.9 |
| Sub-total (2019) | 318181.6 | 0.0 | 0.0 | 153531.3 | 164500.1 | 150.1 | 938.9 | 785.8 | 0.6 | 4.6 | 0.0 | 0.6 | 959.0 |

**Table I-1: Monthly Waste Flow Table for Lyric Theatre Complex**

| Month | Actual Quantities of Inert C&D Materials Generated Monthly | | | | | | | Actual Quantities of C&D Wastes Generated Monthly | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Quantity Generated | Hard Rocks and Large Broken Concrete | Reused in the Contract | Reused in other Projects | Disposed as Public Fill | Disposed to Sorting Facilty | Imported Fill | Metals | Paper/ Cardboard Packaging | Plastics | Wood/ Timber | Chemical Waste | Others, e.g. General Refuse |
| | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) |
| **2020** | | | | | | | | | | | | | |
| Jan | 7089.9 | 0.0 | 0.0 | 0.0 | 7089.9 | 0.0 | 0.0 | 39.6 | 0.2 | 0.0 | 0.0 | 0.0 | 65.7 |
| Feb | 16822.3 | 0.0 | 0.0 | 0.0 | 16822.3 | 0.0 | 0.0 | 240.5 | 0.1 | 0.0 | 0.0 | 0.0 | 66.3 |
| Mar | 6559.0 | 0.0 | 0.0 | 0.0 | 6559.0 | 0.0 | 110.4 | 63.1 | 0.0 | 0.9 | 0.0 | 0.0 | 138.3 |
| Apr | 4997.9 | 0.0 | 0.0 | 1615.7 | 3382.2 | 0.0 | 159.2 | 1129.2 | 1.9 | 0.0 | 0.0 | 0.0 | 113.2 |
| May | 2236.0 | 0.0 | 0.0 | 452.3 | 1783.6 | 0.0 | 0.0 | 412.3 | 0.0 | 0.0 | 0.0 | 0.0 | 188.8 |
| Jun | 1134.3 | 0.0 | 0.0 | 0.0 | 1134.3 | 0.0 | 31.5 | 328.7 | 0.2 | 0.6 | 0.0 | 0.0 | 210.6 |
| Jul | 148.8 | 0.0 | 0.0 | 0.0 | 148.8 | 0.0 | 31.5 | 502.2 | 0.5 | 0.0 | 0.0 | 0.0 | 220.0 |
| Aug | 540.7 | 0.0 | 0.0 | 0.0 | 540.7 | 0.0 | 0.0 | 393.4 | 0.0 | 0.0 | 0.0 | 0.0 | 238.3 |
| Sep | 1432.3 | 0.0 | 0.0 | 0.0 | 1432.3 | 0.0 | 0.0 | 835.6 | 0.2 | 0.0 | 0.0 | 0.0 | 291.9 |
| Oct | 1381.5 | 0.0 | 0.0 | 0.0 | 1381.5 | 0.0 | 0.0 | 756.1 | 0.2 | 0.0 | 0.0 | 0.0 | 400.2 |
| Nov | 1444.1 | 0.0 | 0.0 | 0.0 | 1437.4 | 6.7 | 475.8 | 567.8 | 0.2 | 0.5 | 0.0 | 0.0 | 377.8 |
| Dec | 793.8 | 0.0 | 0.0 | 0.0 | 793.8 | 0.0 | 0.0 | 503.4 | 0.2 | 0.0 | 0.0 | 0.0 | 435.8 |
| Sub-total (2020) | 44580.6 | 0.0 | 0.0 | 2068.1 | 42505.8 | 6.7 | 808.3 | 5771.9 | 3.7 | 2.0 | 0.0 | 0.0 | 2746.8 |
| **2021** | | | | | | | | | | | | | |
| Jan | 881.4 | 0.0 | 0.0 | 0.0 | 881.4 | 0.0 | 0.0 | 906.7 | 0.4 | 0.0 | 0.0 | 0.0 | 497.0 |
| Feb | 544.7 | 0.0 | 0.0 | 0.0 | 544.7 | 0.0 | 0.0 | 206.3 | 0.3 | 0.0 | 0.0 | 0.0 | 504.7 |
| Mar | 406.1 | 0.0 | 0.0 | 0.0 | 406.1 | 0.0 | 0.0 | 1235.0 | 0.3 | 0.0 | 0.0 | 0.0 | 881.7 |
| Apr | 633.0 | 0.0 | 0.0 | 0.0 | 633.0 | 0.0 | 0.0 | 480.8 | 0.7 | 0.0 | 0.0 | 0.0 | 613.0 |
| May | 1125.8 | 0.0 | 0.0 | 0.0 | 1125.8 | 0.0 | 0.0 | 382.8 | 0.2 | 0.1 | 0.0 | 0.0 | 355.2 |
| Jun | 877.3 | 0.0 | 0.0 | 0.0 | 877.3 | 0.0 | 0.0 | 163.7 | 0.2 | 0.0 | 0.0 | 0.4 | 420.3 |
| Jul | 8.9 | 0.0 | 0.0 | 0.0 | 0.0 | 8.9 | 0.0 | 56.5 | 2.0 | 0.0 | 0.0 | 0.0 | 278.2 |
| Aug | 1296.2 | 0.0 | 0.0 | 0.0 | 1296.2 | 0.0 | 0.0 | 270.0 | 0.0 | 0.0 | 0.0 | 0.0 | 459.1 |
| Sep | 1040.5 | 0.0 | 0.0 | 0.0 | 490.9 | 549.6 | 0.0 | 193.2 | 0.0 | 0.0 | 0.0 | 0.0 | 620.8 |
| Oct | 311.0 | 0.0 | 0.0 | 0.0 | 311.0 | 0.0 | 0.0 | 92.0 | 0.3 | 0.0 | 0.0 | 0.0 | 485.6 |
| Nov | 203.9 | 0.0 | 0.0 | 0.0 | 203.9 | 0.0 | 0.0 | 93.9 | 0.0 | 0.0 | 0.0 | 0.0 | 609.6 |
| Dec | 576.6 | 0.0 | 0.0 | 0.0 | 576.6 | 0.0 | 0.0 | 85.2 | 0.0 | 0.0 | 0.0 | 0.0 | 590.6 |
| Sub-total (2021) | 7905.3 | 0.0 | 0.0 | 0.0 | 7346.9 | 558.5 | 0.0 | 4165.9 | 4.4 | 0.1 | 0.0 | 0.4 | 6315.9 |

**Table I-1: Monthly Waste Flow Table for Lyric Theatre Complex**

| Month | Actual Quantities of Inert C&D Materials Generated Monthly | | | | | | | Actual Quantities of C&D Wastes Generated Monthly | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Quantity Generated | Hard Rocks and Large Broken Concrete | Reused in the Contract | Reused in other Projects | Disposed as Public Fill | Disposed to Sorting Facilty | Imported Fill | Metals | Paper/ Cardboard Packaging | Plastics | Wood/ Timber | Chemical Waste | Others, e.g. General Refuse |
| | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) |
| **2022** | | | | | | | | | | | | | |
| Jan | 579.3 | 0.0 | 0.0 | 0.0 | 579.3 | 0.0 | 0.0 | 41.3 | 0.4 | 0.0 | 0.0 | 0.0 | 565.5 |
| Feb | 58.9 | 0.0 | 0.0 | 0.0 | 58.9 | 0.0 | 0.0 | 85.7 | 0.0 | 0.0 | 0.0 | 0.0 | 172.2 |
| Mar | 412.8 | 0.0 | 0.0 | 0.0 | 412.8 | 0.0 | 0.0 | 87.1 | 0.3 | 0.0 | 0.0 | 0.0 | 339.8 |
| Apr | 390.2 | 0.0 | 0.0 | 0.0 | 390.2 | 0.0 | 0.0 | 44.7 | 0.0 | 0.0 | 0.0 | 0.0 | 390.9 |
| May | 357.3 | 0.0 | 0.0 | 0.0 | 350.1 | 7.2 | 0.0 | 99.4 | 0.3 | 0.0 | 0.0 | 0.0 | 401.9 |
| Jun | 200.4 | 0.0 | 0.0 | 0.0 | 200.4 | 0.0 | 0.0 | 134.7 | 0.0 | 0.0 | 0.0 | 1.1 | 447.8 |
| Jul | 166.8 | 0.0 | 0.0 | 0.0 | 166.8 | 0.0 | 0.0 | 15.3 | 0.3 | 0.0 | 0.0 | 0.7 | 343.9 |
| Aug | 150.9 | 0.0 | 0.0 | 0.0 | 150.9 | 0.0 | 0.0 | 9.6 | 0.4 | 0.2 | 0.0 | 0.0 | 410.6 |
| Sep | 437.6 | 0.0 | 0.0 | 0.0 | 437.6 | 0.0 | 0.0 | 11.5 | 0.3 | 0.0 | 0.0 | 0.0 | 348.3 |
| Oct | 708.0 | 0.0 | 0.0 | 0.0 | 708.0 | 0.0 | 0.0 | 13.8 | 0.0 | 0.0 | 0.0 | 0.0 | 353.0 |
| Nov | 244.1 | 0.0 | 0.0 | 0.0 | 244.1 | 0.0 | 0.0 | 47.3 | 0.3 | 0.0 | 0.0 | 0.0 | 427.4 |
| Dec | 337.4 | 0.0 | 0.0 | 0.0 | 337.4 | 0.0 | 0.0 | 28.1 | 0.0 | 0.0 | 0.0 | 0.0 | 385.3 |
| Sub-total (2022) | 4043.5 | 0.0 | 0.0 | 0.0 | 4036.3 | 7.2 | 0.0 | 618.3 | 2.3 | 0.3 | 0.0 | 1.8 | 4586.5 |

**Table I-1: Monthly Waste Flow Table for Lyric Theatre Complex**

| Month | Actual Quantities of Inert C&D Materials Generated Monthly | | | | | | | Actual Quantities of C&D Wastes Generated Monthly | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Quantity Generated | Hard Rocks and Large Broken Concrete | Reused in the Contract | Reused in other Projects | Disposed as Public Fill | Disposed to Sorting Facilty | Imported Fill | Metals | Paper/ Cardboard Packaging | Plastics | Wood/ Timber | Chemical Waste | Others, e.g. General Refuse |
| | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) |
| **2023** | | | | | | | | | | | | | |
| Jan | 307.0 | 0.0 | 0.0 | 0.0 | 307.0 | 0.0 | 0.0 | 44.5 | 0.2 | 0.0 | 0.0 | 0.0 | 415.1 |
| Feb | 1087.8 | 0.0 | 0.0 | 0.0 | 1087.8 | 0.0 | 0.0 | 22.9 | 0.4 | 0.0 | 0.0 | 0.0 | 411.4 |
| Mar | 1944.0 | 0.0 | 0.0 | 0.0 | 1944.0 | 0.0 | 0.0 | 37.7 | 0.0 | 0.0 | 0.0 | 0.0 | 469.6 |
| Apr | 819.5 | 0.0 | 0.0 | 0.0 | 819.5 | 0.0 | 0.0 | 218.7 | 0.1 | 0.0 | 0.0 | 0.0 | 320.5 |
| May | 842.1 | 0.0 | 0.0 | 0.0 | 842.1 | 0.0 | 0.0 | 35.6 | 0.3 | 0.0 | 0.0 | 0.0 | 439.4 |
| Jun | 952.1 | 0.0 | 0.0 | 0.0 | 952.1 | 0.0 | 0.0 | 22.9 | 0.2 | 0.0 | 0.0 | 0.0 | 399.3 |
| Jul | 583.1 | 0.0 | 0.0 | 0.0 | 583.1 | 0.0 | 0.0 | 38.3 | 0.0 | 0.0 | 0.0 | 0.0 | 421.6 |
| Aug | 778.2 | 0.0 | 0.0 | 0.0 | 778.2 | 0.0 | 0.0 | 28.5 | 0.0 | 0.0 | 0.0 | 0.0 | 427.9 |
| Sep | 316.4 | 0.0 | 0.0 | 0.0 | 316.4 | 0.0 | 0.0 | 14.8 | 0.1 | 0.0 | 0.0 | 0.0 | 344.3 |
| Oct | 1253.3 | 0.0 | 0.0 | 0.0 | 1253.3 | 0.0 | 0.0 | 17.9 | 0.0 | 0.0 | 0.0 | 0.0 | 353.9 |
| Nov | 862.7 | 0.0 | 0.0 | 0.0 | 862.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 436.4 |
| Dec | 337.8 | 0.0 | 0.0 | 0.0 | 337.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 374.0 |
| Sub-total (2023) | 10084.0 | 0.0 | 0.0 | 0.0 | 10084.0 | 0.0 | 0.0 | 481.8 | 1.3 | 0.0 | 0.0 | 0.0 | 4813.3 |
| **2024** | | | | | | | | | | | | | |
| Jan | 256.8 | 0.0 | 0.0 | 0.0 | 256.8 | 0.0 | 0.0 | 11.1 | 0.6 | 0.0 | 0.0 | 0.0 | 448.6 |
| Feb | 321.4 | 0.0 | 0.0 | 0.0 | 321.4 | 0.0 | 0.0 | 9.4 | 0.6 | 0.0 | 0.0 | 0.0 | 263.4 |
| Mar | 1167.4 | 0.0 | 0.0 | 0.0 | 1167.4 | 0.0 | 0.0 | 445.3 | 0.2 | 0.0 | 0.0 | 0.0 | 360.9 |
| Apr | 283.5 | 0.0 | 0.0 | 0.0 | 283.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 467.1 |
| Sub-total (2024) | 2029.1 | 0.0 | 0.0 | 0.0 | 2029.1 | 0.0 | 0.0 | 465.8 | 1.4 | 0.0 | 0.0 | 0.0 | 1540.0 |
| **Total** | **1010758.4** | **0.0** | **0.0** | **543635.2** | **466123.3** | **999.9** | **2301.1** | **13480.8** | **15.3** | **10.8** | **0.0** | **14.7** | **22234.0** |

Note:

- 235.44 tonnes, 48.02 tonnes and 0.0 tonne of inert C&D materials were disposed of as public fill to Tseung Kwan O Area 137 Public Fill, Tuen Mun Area 38 Public Fill and Chai Wan Public Fill Barging Point respectively in the reporting month.

# J. Environmental Mitigation Measures – Implementation Status

**Table J-1: Environmental Mitigation Measures Implementation Status (April 2024)**

| EM&A Ref. | Recommendation Measures | Implementation Stage L2 |
|---|---|---|
| **Air Quality Impact (Construction)** | | |
| 2.1 & 10.3.1 | **General Dust Control Measures**<br>Frequent water spraying for active construction areas (12 times a day or once every one hour), including Heavy construction activities such as construction of buildings or roads, drilling, ground excavation, cut and fill operations (i.e., earth moving) | Obs |
| 2.1 & 10.3.1 | **Best Practice For Dust Control**<br>The relevant best practices for dust control as stipulated in the Air Pollution Control (construction Dust) Regulation should be adopted to further reduce the construction dust impacts from the Project. These best practices include:<br>*Good Site Management*<br>• Good site management is important to help reducing potential air quality impact down to an acceptable level. As a general guide, the Contractor should maintain high standard of housekeeping to prevent emission of fugitive dust. Loading, unloading, handling and storage of raw materials, wastes or by-products should be carried out in a manner so as to minimise the release of visible dust emission. Any piles of materials accumulated on or around the work areas should be cleaned up regularly. Cleaning, repair and maintenance of all plant facilities within the work areas should be carried out in a manner minimising generation of fugitive dust emissions. The material should be handled properly to prevent fugitive dust emission before cleaning. | Obs |
| | *Disturbed Parts of the Roads*<br>• Each and every main temporary access should be paved with concrete, bituminous hardcore materials or metal plates and kept clear of dusty materials; or | ✓ |
| | • Unpaved parts of the road should be sprayed with water or a dust suppression chemical so as to keep the entire road surface wet. | ✓ |
| | *Exposed Earth*<br>• Exposed earth should be properly treated by compaction, hydroseeding, vegetation planting or seating with latex, vinyl, bitumen within six months after the last construction activity on the site or part of the site where the exposed earth lies. | N/A<br>No exposed earth in this project. |
| | *Loading, Unloading or Transfer of Dusty Materials*<br>• All dusty materials should be sprayed with water immediately prior to any loading or transfer operation so as to keep the dusty material wet. | ✓ |
| | *Debris Handling*<br>• Any debris should be covered entirely by impervious sheeting or stored in a debris collection area sheltered on the top and the three sides. | ✓ |
| | • Before debris is dumped into a chute, water should be sprayed so that it remains wet when it is dumped. | ✓ |

| EM&A Ref. | Recommendation Measures | Implementation Stage<br>L2 |
|---|---|---|
| | *Transport of Dusty Materials* | |
| | • Vehicle used for transporting dusty materials/spoils should be covered with tarpaulin or similar material. The cover should extend over the edges of the sides and tailboards. | ✓ |
| | *Wheel washing* | |
| | • Vehicle wheel washing facilities should be provided at each construction site exit. Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels. | ✓ |
| | *Use of vehicles* | |
| | • The speed of the trucks within the site should be controlled to about 10km/hour in order to reduce adverse dust impacts and secure the safe movement around the site. | ✓ |
| | • Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels. | ✓ |
| | • Where a vehicle leaving the construction site is carrying a load of dusty materials, the load should be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle. | ✓ |
| | *Site hoarding* | |
| | • Where a site boundary adjoins a road, street, service lane or other area accessible to the public, hoarding of not less than 2.4m high from ground level should be provided along the entire length of that portion of the site boundary except for a site entrance or exit. | ✓ |
| 2.1 & 10.3.1 | **Best Practicable Means for Cement Works (Concrete Batching Plant)**<br>The relevant best practices for dust control as stipulated in the Guidance Note on the Best Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2(93) should be followed and implemented to further reduce the construction dust impacts of the Project. These best practices include: | |
| | Exhaust from Dust Arrestment Plant | |
| | • Wherever possible the final discharge point from particulate matter arrestment plant, where is not necessary to achieve dispersion from residual pollutants, should be at low level to minimise the effect on the local community in the case of abnormal emissions and to facilitate maintenance and inspection | N/A<br>No concrete batching plant in this project. |
| | Emission Limits | |
| | • All emissions to air, other than steam or water vapour, shall be colourless and free from persistent mist or smoke | N/A<br>No concrete batching plant in this project. |
| | Engineering Design/Technical Requirements | |
| | • As a general guidance, the loading, unloading, handling and storage of fuel, raw materials, products, wastes or by-products should be carried out in a manner so as to prevent the release of visible dust and/or other noxious or offensive emissions | N/A<br>No concrete batching plant in this project. |

| EM&A Ref. | Recommendation Measures | Implementation Stage L2 |
|---|---|---|
| | **Non-Road Mobile Machinery (NRMM):**<br>All NRMMs operating on-site which are subject to emission control of Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation are approved/exempted (as the case may be) and affixed with the requisite approval/exemption labels. | ✓ |
| **Noise Impact (Construction)** | | |
| 3.1 & 10.4.1 | **Good Site Practice**<br>Good site practice and noise management can significantly reduce the impact of construction site activities on nearby NSRs. The following package of measures should be followed during each phase of construction:<br>• only well-maintained plant to be operated on-site and plant should be serviced regularly during the construction works;<br>• machines and plant that may be in intermittent use to be shut down between work periods or should be throttled down to a minimum<br>• plant known to emit noise strongly in one direction, should, where possible, be orientated to direct noise away from the NSRs;<br>• mobile plant should be sited as far away from NSRs as possible; and<br>• material stockpiles and other structures to be effectively utilised, where practicable, to screen noise from on-site construction activities. | ✓<br>✓<br>✓<br>✓<br>✓ |
| 3.1 & 10.4.1 | **Adoption of Quieter PME**<br>The recommended quieter PME adopted in the assessment were taken from the EPD's QPME Inventory and "*Sound Power Levels of Other Commonly Used PME*" are presented in **Table 4.26** in the EIA report. It should be noted that the silenced PME selected for assessment can be found in Hong Kong. | ✓ |
| 3.1 & 10.4.1 | **Use of Movable Noise Barriers**<br>Movable noise barriers can be very effective in screening noise from particular items of plant when constructing the Project. Noise barriers located along the active works area close to the noise generating component of a PME could produce at least 10 dB(A) screening for stationary plant and 5 dB(A) for mobile plant provided the direct line of sight between the PME and the NSRs is blocked. | ✓ |
| 3.1 & 10.4.1 | **Use of Noise Enclosure/ Acoustic Shed**<br>The use of noise enclosure or acoustic shed is to cover stationary PME such as air compressor and concrete pump. With the adoption of the noise enclosure, the PME could be completely screened, and noise reduction of 15 dB(A) can be achieved according to the EIAO Guidance Note No. 9/2010. | ✓ |
| 3.1 & 10.4.1 | **Use of Noise Insulating Fabric**<br>Noise insulating fabric can also be adopted for certain PME (e.g. drill rig, pilling machine etc). The fabric should be lapped such that there are no openings or gaps on the joints. According to the approved Tsim Sha Tsui Station Northern Subway EIA report (AEIAR-127/2008), a noise reduction of 10 dB(A) can be achieved for the PME lapped with the noise insulating fabric. | Rem<br>Obs |

| EM&A Ref. | Recommendation Measures | Implementation Stage<br>L2 |
|---|---|---|
| 3.1 & 10.4.1 | **Scheduling of Construction Works outside School Examination Periods**<br>During construction phase, the contractor should liaise with the educational institutions (including NSRs LCS and CRGPS) to obtain the examination schedule and avoid the noisy construction activities during school examination periods. | N/A<br>No educational institutions nearby the site. |
| **Water Quality Impact (Construction)** | | |
| 4.1 & 10.5.1 | **Construction site runoff and drainage**<br>The site practices outlined in ProPECC Note PN 1/94 should be followed as far as practicable in order to minimise surface runoff and the chance of erosion. The following measures are recommended to protect water quality and sensitive uses of the coastal area, and when properly implemented should be sufficient to adequately control site discharges so as to avoid water quality impacts: | |
| | • At the start of site establishment, perimeter cut-off drains to direct off-site water around the site should be constructed with internal drainage works and erosion and sedimentation control facilities implemented. Channels, earth bunds or sand bag barriers should be provided on site to direct storm water to silt removal facilities. The design of the temporary on-site drainage system should be undertaken by the WKCDA's Contractor prior to the commencement of construction; | ✓ |
| | • Sand/silt removal facilities such as sand/silt traps and sediment basins should be provided to remove sand/silt particles from runoff to meet the requirements of the TM standards under the WPCO. The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC Note PN 1/94. Sizes may vary depending upon the flow rate. The detailed design of the sand/silt traps should be undertaken by the WKCDA's Contractor prior to the commencement of construction. | ✓ |
| | • All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly during rainstorms. Deposited silt and grit should be regularly removed, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times. | Obs |
| | • Measures should be taken to minimize the ingress of site drainage into excavations. If excavation of trenches in wet periods is necessary, they should be dug and backfilled in short sections wherever practicable. Water pumped out from foundation excavations should be discharged into storm drains via silt removal facilities. | ✓ |
| | • All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facility should be provided at construction site exit where practicable. Wash-water should have sand and silt settled out and removed regularly to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains. | ✓ |
| | • Open stockpiles of construction materials or construction wastes on-site should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system. | ✓ |
| | • Manholes (including newly constructed ones) should be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and stormwater runoff being directed into foul sewers. | ✓ |

| EM&A Ref. | Recommendation Measures | Implementation Stage<br>L2 |
|---|---|---|
| | • Precautions should be taken at any time of the year when rainstorms are likely. Actions should be taken when a rainstorm is imminent or forecasted and actions to be taken during or after rainstorms are summarized in Appendix A2 of ProPECC Note PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes. | ✓ |
| | • Bentonite slurries used in piling or slurry walling should be reconditioned and reused wherever practicable. Temporary enclosed storage locations should be provided on-site for any unused bentonite that needs to be transported away after all the related construction activities are completed. The requirements in ProPECC Note PN 1/94 should be adhered to in the handling and disposal of bentonite slurries. | N/A<br>No bentonite slurries are used in this project. |
| | **Barging facilities and activities** | |
| | Recommendations for good site practices during operation of the proposed barging point include: | |
| | • All vessels should be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; | N/A<br>No barging facilities in this project. |
| | • Loading of barges and hoppers should be controlled to prevent splashing of material into the surrounding water. Barges or hoppers should not be filled to a level that will cause the overflow of materials or polluted water during loading or transportation; | N/A<br>No barging facilities in this project. |
| | • All hopper barges should be fitted with tight fitting seals to their bottom openings to prevent leakage of material; and | N/A<br>No barging facilities in this project. |
| | • Construction activities should not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site. | N/A<br>No barging facilities in this project. |
| 4.1 & 10.5.1 | **Sewage effluent from construction workforce**<br>Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site where necessary to handle sewage from the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance. | ✓ |
| 4.1 & 10.5.1 | **General construction activities** | |
| | • Construction solid waste, debris and refuse generated on-site should be collected, handled and disposed of properly to avoid entering any nearby storm water drain. Stockpiles of cement and other construction materials should be kept covered when not being used. | ✓ |
| | • Oils and fuels should only be stored in designated areas which have pollution prevention facilities. To prevent spillage of fuels and solvents to any nearby storm water drain, all fuel tanks and storage areas should be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. The bund should be drained of rainwater after a rain event. | Rem<br>Obs |

| EM&A Ref. | Recommendation Measures | Implementation Stage L2 |
|---|---|---|
| **Waste Management Implications (Construction)** | | |
| 6.1 & 10.7.1 | **Good Site Practices** | |
| | Recommendations for good site practices during the construction activities include: | |
| | • Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site | ✓ |
| | • Training of site personnel in proper waste management and chemical handling procedures | ✓ |
| | • Provision of sufficient waste disposal points and regular collection of waste | Obs |
| | • Appropriate measures to minimise windblown litter and dust/odour during transportation of waste by either covering trucks or by transporting wastes in enclosed containers | ✓ |
| | • Provision of wheel washing facilities before the trucks leaving the works area so as to minimise dust introduction to public roads | ✓ |
| | • Well planned delivery programme for offsite disposal such that adverse environmental impact from transporting the inert or non-inert C&D materials is not anticipated | ✓ |
| 6.1 & 10.7.1 | **Waste Reduction Measures** | |
| | Recommendations to achieve waste reduction include: | |
| | • Sort inert C&D material to recover any recyclable portions such as metals | ✓ |
| | • Segregation and storage of different types of waste in different containers or skips to enhance reuse or recycling of materials and their proper disposal | ✓ |
| | • Encourage collection of recyclable waste such as waste paper and aluminium cans by providing separate labelled bins to enable such waste to be segregated from other general refuse generated by the work force | ✓ |
| | • Proper site practices to minimise the potential for damage or contamination of inert C&D materials | ✓ |
| | • Plan the use of construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of wastes | ✓ |
| 6.1 & 10.7.1 | **Inert and Non-inert C&D Materials** | |
| | In order to minimise impacts resulting from collection and transportation of inert C&D material for off-site disposal, the excavated materials should be reused on-site as fill material as far as practicable. In addition, inert C&D material generated from excavation works could be reused as fill materials in local projects that require public fill for reclamation. | ✓ |
| | • The surplus inert C&D material will be disposed of at the Government's PFRFs for beneficial use by other projects in Hong Kong. | ✓ |
| | • Liaison with the CEDD Public Fill Committee (PFC) on the allocation of space for disposal of the inert C&D materials at PFRF is underway. No construction work is allowed to proceed until all issues on management of inert C&D materials have been resolved and all relevant arrangements have been endorsed by the relevant authorities including PFC and EPD. | ✓ |
| | • The C&D materials generated from general site clearance should be sorted on site to segregate any inert materials for reuse or disposal of at PFRFs whereas the non-inert materials will be disposed of at the designated landfill site. | ✓ |

| EM&A Ref. | Recommendation Measures | Implementation Stage L2 |
|---|---|---|
| | • In order to monitor the disposal of inert and non-inert C&D materials at respectively PFRFs and the designated landfill site, and to control fly-tipping, it is recommended that the Contractor should follow the Technical Circular (Works) No. 6/2010 for Trip Ticket System for Disposal of Construction & Demolition Materials issued by Development Bureau. In addition, it is also recommended that the Contractor should prepare and implement a Waste Management Plan detailing their various waste arising and waste management practices in accordance with the relevant requirements of the Technical Circular (Works) No. 19/2005 Environmental Management on Construction Site. | ✓ |
| 6.1 & 10.7.1 | **Chemical Waste**<br>• If chemical wastes are produced at the construction site, the Contractor will be required to register with the EPD as a chemical waste producer and to follow the guidelines stated in the "Code of Practice on the Packaging Labelling and Storage of Chemical Wastes". Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor should use a licensed collector to transport and dispose of the chemical wastes at the approved Chemical Waste Treatment Centre or other licensed recycling facilities, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation. | ✓ |
| | • Potential environmental impacts arising from the handling activities (including storage, collection, transportation and disposal of chemical waste) are expected to be minimal with the implementation of appropriate mitigation measures as recommended. | ✓ |
| 6.1 & 10.7.1 | **General Refuse**<br>General refuse should be stored in enclosed bins or compaction units separated from inert C&D materials. A reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from inert C&D materials. Preferably an enclosed and covered area should be provided to reduce the occurrence of 'wind blown' light material. | Obs |
| **Land Contamination (Construction)** | | |
| 7.1 & 10.8.1 | The potential for land contamination issues at the TST Fire Station due to its future relocation will be confirmed by site investigation after land acquisition. Where necessary, mitigation measures for minimising potential exposure to contaminated materials (if any) or remediation measures will be identified. If contaminated land is identified (e.g., during decommissioning of fuel oil storage tanks) after the commencement of works, mitigation measures are proposed in order to minimise the potentially adverse effects on the health and safety of construction workers and impacts arising from the disposal of potentially contaminated materials.<br>The following measures are proposed for excavation and transportation of contaminated material:<br>• To minimize the chance for construction workers to come into contact with any contaminated materials, bulk earth-moving excavation equipment should be employed; | N/A<br>TST Fire Station is out of this project boundary, no mitigation measure is required. |

| EM&A Ref. | Recommendation Measures | Implementation Stage<br>L2 |
|---|---|---|
| | • Contact with contaminated materials can be minimised by wearing appropriate clothing and personal protective equipment such as gloves and masks (especially when interacting directly with contaminated material), provision of washing facilities and prohibition of smoking and eating on site; | N/A<br>TST Fire Station is out of this project boundary, no mitigation measure is required. |
| | • Stockpiling of contaminated excavated materials on site should be avoided as far as possible; | N/A<br>TST Fire Station is out of this project boundary, no mitigation measure is required. |
| | • The use of contaminated soil for landscaping purpose should be avoided unless pre-treatment was carried out; | N/A<br>TST Fire Station is out of this project boundary, no mitigation measure is required. |
| | • Vehicles containing any contaminated excavated materials should be suitably covered to reduce dust emissions and/or release of contaminated wastewater; | N/A<br>TST Fire Station is out of this project boundary, no mitigation measure is required. |
| | • Truck bodies and tailgates should be sealed to stop any discharge; | N/A<br>TST Fire Station is out of this project boundary, no mitigation measure is required. |
| | • Only licensed waste haulers should be used to collect and transport contaminated material to treatment/disposal site and should be equipped with tracking system to avoid fly tipping; | N/A<br>TST Fire Station is out of this project boundary, no mitigation measure is required. |
| | • Speed control for trucks carrying contaminated materials should be exercised; | N/A<br>TST Fire Station is out of this project boundary, no mitigation measure is required. |
| | • Observe all relevant regulations in relation to waste handling, such as Waste Disposal Ordinance (Cap. 354), Waste Disposal (Chemical Waste) (General) Regulation (Cap. 354) and obtain all necessary permits where required; and | N/A<br>TST Fire Station is out of this project boundary, no mitigation measure is required. |

| EM&A Ref. | Recommendation Measures | Implementation Stage<br>L2 |
|---|---|---|
| | • Maintain records of waste generation and disposal quantities and disposal arrangements. | N/A<br>TST Fire Station is out of this project boundary, no mitigation measure is required. |
| **Ecological Impact (Construction)** | | |
| | No mitigation measure is required. | |
| **Landscape and Visual Impact (Construction)** | | |
| Table 9.1 & 10.8 (CM1) | Trees should be retained in situ on site as far as possible. Should tree removal be unavoidable due to construction impacts, trees will be transplanted or felled with reference to the stated criteria in the Tree Removal Applications to be submitted to relevant government departments for approval in accordance to ETWB TCW No. 29/2004 and 3/2006. | N/A<br>No trees under this Contract. |
| Table 9.1 & 10.8 (CM2) | Compensatory tree planting shall be incorporated to the proposed project and maximize the new tree, shrubs and other vegetation planting to compensate tree felled and vegetation removed. Also, implementation of compensatory planting should be of a ratio not less than 1:1 in terms of quality and quantity within the site. | N/A<br>Compensatory tree planting is being reviewed. |
| Table 9.1 & 10.8 (CM3) | Buffer trees for screening purposes to soften the hard architectural and engineering structures and facilities. | N/A<br>Roof garden is designed to be built, but it has not been completed yet. |
| Table 9.1 & 10.8 (CM4) | Softscape treatments such as vertical green wall panel /planting of climbing and/or weeping plants, etc, to maximize the green coverage and soften the hard architectural and engineering structures and facilities. | N/A<br>Climbing or weeping plants are designed to be planted, but proposal is being reviewed for the planting location. |
| Table 9.1 & 10.8 (CM5) | Roof greening by means of intensive and extensive green roof to maximize the green coverage and improve aesthetic appeal and visual quality of the building/structure. | N/A<br>Roof garden is designed to be built, but it has not been completed yet. |
| Table 9.1 & 10.8 (CM6) | Sensitive streetscape design should be incorporated along all new roads and streets. | N/A<br>Greening along the seafront is proposed, but it has not been completed yet. |
| Table 9.1 & 10.8 (CM7) | Structure, ornamental planting shall be provided along amenity strips to enhance the landscape quality. | N/A<br>Gardens are designed to be built, but it has not been completed yet. |

| EM&A Ref. | Recommendation Measures | Implementation Stage<br>L2 |
|---|---|---|
| Table 9.1 & 10.8 (CM8) | Landscape design shall be incorporated to architectural and engineering structures in order to provide aesthetically pleasing designs. | N/A<br>Roof garden is designed to be built, but it has not been completed yet. |
| Table 9.1 (CM9) | Minimize the structure of marine facilities to be built on the seabed and foreshore in order to minimize the affected extent to the waterbody | N/A<br>No marine facilities for this project. |
| Table 9.2 & 10.9 (MCP1) | Use of decorative screen hoarding/boards | ✓ |
| Table 9.2 & 10.9 (MCP2) | Early introduction of landscape treatments | N/A<br>No landscape treatments during this stage. |
| Table 9.2 & 10.9 (MCP3) | Adoption of light colour for the temporary ventilation shafts for the basement during the transition period. | N/A<br>No ventilation shafts for this project. |
| Table 9.2 & 10.9 (MCP4) | Control of night time lighting | N/A |
| Table 9.2 & 10.9 (MCP5) | Use of greenery such as grass cover for the temporary open areas will help achieve the visual balance and soften the hard edges of the structures. | N/A<br>No temporary open areas for this project. |

N/A - Not Applicable
✓ - Implemented
Obs - Observed
Rem - Reminder

# K. Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions

Cumulative statistics for complaints, notifications of summons and successful prosecutions for the Project account for period starting from the date of commencement of construction works to the end of the reporting month are summarised in the **Table K-1** below respectively.

**Table K-1: Statistics for complaints, notifications of summons and successful prosecutions for Lyric Theatre Complex**

| Reporting Period | Cumulative Statistics | | |
|---|---|---|---|
| | **Complaints** | **Notifications of summons** | **Successful prosecutions** |
| This reporting month | 0 | 0 | 0 |
| From 1 March 2016 to end of the reporting month (April 2024) | 59 | 0 | 0 |

# END OF PART-1

# Part-2: EM&A for Foundation Works in Zone 2B & 2C


# Foundation Works in Zone 2B & 2C

**APEX TESTING & CERTIFICATION LIMITED**
**Unit D6A, 10/F, TML Plaza, 3 Hoi Shing Road, Tsuen Wan, N.T.**
**Hong Kong**
**Tel: (852) 39733585 Fax: (852) 30079385**
**Email: info@apextestcert.com**

# Contents

# Executive summary

Apex Testing & Certification Limited (Apex) was commissioned to undertake the Environmental Team (ET) services (including environmental monitoring and audit (EM&A)) for the construction activities in Zone 2A, consisting of Foundation, Excavation and Lateral Support Works for Integrated Basement and Underground Road (Contract No.: GW/2020/05/073); and Zone 2B & 2C consisting of Piling Works for Integrated Basement and Underground Road (Contract No.: CC/2020/2B/088) at WKCD. The major construction works and EM&A programme for Zone 2A and Zone 2B & 2C commenced on 03 October 2020 and 30 September 2021 respectively. The construction work for Zone 2A (Contract No.: GW/2020/05/073) was completed and handover to WKCDA on 31 March 2023. No construction work and only maintenance work is carried out by Zone 2B & 2C Contractor at Zone 2A.

The Project Proponent is the West Kowloon Cultural District Authority (WKCDA). The overall works for the WKCD fall under two separate categories of Designated Project (DP) of the Environmental Impact Assessment Ordinance (EIAO), namely an “engineering feasibility study of urban development projects with a study area covering more than 20 ha or involving a total population of more than 100 000” (Item 1 of Schedule 3) and “an underpass more than 100m in length under the built areas” (Item A.9, Part I, Schedule 2). An Environmental Permit No. EP-453/2013/B (EP) was issued with respect to the “Underpass Road and Austin Road Flyover Serving the West Kowloon Cultural District” which specifically includes the abovementioned category of DP under Item A.9, Part I, Schedule 2 of the EIAO.

This Monthly EM&A Report presents the monitoring works at Zone 2B & 2C from 01 to 30 April 2024.

**Exceedance of Action and Limit Levels**

There was no breach of Action or Limit levels for Air Quality (1-hour TSP and 24-hour TSP) and Construction Noise in this reporting month.

**Implementation of Mitigation Measures**

Construction phase weekly site inspections were carried out on 03, 10, 17 and 24 April 2024 for Zone 2B & 2C to confirm the implementation measures undertaken by the Contractors in the reporting month. The outcomes are presented in Section 4 and the status of implementation of mitigation measures in the site is shown in **Appendix J**.

Landscape and visual impact inspections were conducted as part of the abovementioned weekly site inspections during the reporting month. No adverse comment on landscape and visual aspects was made during these inspections.

**Record of Complaints**

No environmental complaint was recorded in the reporting month.

**Record of Notifications of Summons and Successful Prosecutions**

No notifications of summons and successful prosecutions were recorded in the reporting month.

**Future Key Issues**

The major site works for Zone 2B & 2C scheduled to be commissioned in the coming month include:

- Site Maintenance
- Backfilling of Testing Pipes
- Pile Testing
    - Full Core Drilling

Potential environmental impacts due to the construction activities, including air, noise, water quality, waste, landscape and visual, will be monitored or reviewed. The recommended environmental mitigation measures shall be implemented on site and regular inspections as required will be carried out to ensure that the environmental conditions are acceptable.

# 1 Introduction

## 1.1 Background

Apex Testing & Certification Limited (Apex) was commissioned to undertake the Environmental Team (ET) services (including environmental monitoring and audit (EM&A)) for the construction activities in Zone 2A, consisting of Foundation, Excavation and Lateral Support Works for Integrated Basement and Underground Road (Contract No.: GW/2020/05/073) ; and Zone 2B & 2C consisting of Piling Works for Integrated Basement and Underground Road (Contract No.: CC/2020/2B/088) at WKCD. The purpose of the development in Zone 2A and Zone 2B & 2C is to reserve for Integrated Basement (IB) and Underground Road (UR). The Zone 2A construction activities involve the foundation, excavation and lateral support (ELS) works, road works, drainage diversion works, and temporary car parking. The Zone 2B & 2C construction activities involve the piling works. The major construction works and EM&A programme for Zone 2A and Zone 2B & 2C commenced on 03 October 2020 and 30 September 2021 respectively. The major construction work for Zone 2A (Contract No.: GW/2020/05/073) was completed and handover to WKCDA on 31 March 2023. No construction work and only maintenance work is carried out by Zone 2B & 2C Contractor at Zone 2A.

The overall works for the WKCD fall under two separate categories of Designated Project (DP) of the Environmental Impact Assessment Ordinance (EIAO), namely an “engineering feasibility study of urban development projects with a study area covering more than 20 ha or involving a total population of more than 100 000” (Item 1 of Schedule 3) and “an underpass more than 100m in length under the built areas” (Item A.9, Part I, Schedule 2). An Environmental Permit No. EP-453/2013/B (EP) was issued with respect to the “Underpass Road and Austin Road Flyover Serving the West Kowloon Cultural District” which specifically includes the abovementioned category of DP under Item A.9, Part I, Schedule 2 of the EIAO. The captioned projects include part of the abovementioned underpass road located within the site boundary falls under this same category.

The Monthly EM&A Report is prepared in accordance with the Condition 3.4 of the Environmental Permit No. EP-453/2013/B. This Monthly EM&A Report presents the monitoring works at Zone 2B & 2C from 01 to 30 April 2024. The purpose of this report is to summarise the findings in the EM&A of the project over the reporting period.

## 1.2 Project Organisation

The organisation chart and lines of communication with respect to the on-site environmental management structure together with the contact information of the key personnel are shown in **Appendix A**.

## 1.3 Construction Works Status in the Reporting Period

During the reporting period, construction works at Zone 2B & 2C undertaken include:

- Site Maintenance
- Backfilling of Testing Pipes
- Pile Testing
    - Full Core Drilling

The Construction Works Programme of Zone 2B & 2C is provided in **Appendix B**. A layout plan of the Project is provided in **Figure 1**. Please refer to **Table 4.2** on the status of the environmental licenses.

## 1.4 Summary of EM&A Requirements and Alternative Monitoring Locations

### 1.4.1 EM&A Requirements

The EM&A programme requires environmental monitoring of air quality, noise, landscape and visual as specified in the approved EM&A Manual.

A summary of impact EM&A requirements is presented in **Table 1.1**.

**Table 1.1: Summary of Impact EM&A Requirements**

| Parameters | Descriptions | Locations | Frequencies |
|---|---|---|---|
| Air Quality | 24-Hours TSP | AM3-The Victoria Towers Tower 1 | At least once every 6 days |
| | 1-Hour TSP | AM3-The Victoria Towers Tower 1 | At least 3 times every 6 days |
| | 24-Hours TSP | AM4-Canton Road Government Primary School | At least once every 6 days |
| | 1-Hour TSP | AM4-Canton Road Government Primary School | At least 3 times every 6 days |
| | 24-Hours TSP | AM5-Topside Developments at West Kowloon Terminus Site | At least once every 6 days |
| | 1-Hour TSP | AM5-Topside Developments at West Kowloon Terminus Site | At least 3 times every 6 days |
| Noise | Leq, 30 minutes | NM2-The Arch, Sun Tower | Weekly |
| | Leq, 30 minutes | NM3-The Victoria Towers Tower 1 | Weekly |
| | Leq, 30 minutes | NM4-Canton Road Government Primary School | Weekly |
| | Leq, 30 minutes | NM5-Development next to Austin Station | Weekly |
| Landscape & Visual | Monitor implementation of proposed mitigation measures during the construction stage | As described in Table 9.1 and 9.2 of the EM&A Manual | Bi-Weekly |

### 1.4.2 Alternative Monitoring Locations

The EM&A programme for the Project should require 5 noise monitoring station and 5 air quality monitoring stations located closest to the Project area. With regard to the monitoring activities at M+ Museum and the Lyric Complex, three monitoring stations had been considered, including AM1 (International Commerce Centre), AM2 (The Harbourside Tower 1) for air monitoring, and NM1 (The Harbourside Tower 1) for noise monitoring.

In the context of the construction activities in Zone 2A and Zone 2B & 2C, all other monitoring locations including AM3 (The Victoria Towers Tower 1), AM4 (Canton Road Government Primary School), and AM5 (Topside Developments at West Kowloon Terminus Site) for air monitoring; and NM2 (The Arch, Sun Tower), NM3 (The Victoria Towers Tower 1), NM4 (Canton Road Government Primary School) and NM5 (Development next to Austin Station) for noise monitoring,

have been taken into account. However, access to all these originally designated monitoring stations was declined as described below point-by-point.

The Arch management office and owners' committee have formally declined the proposal of setting up noise monitoring instrument on its premises at the podium level of Sun Tower (NM2) on 24 July 2014. Thus, alternative noise monitoring location was identified at the ground floor in front of The Arch – Sun Tower (NM2A), which is at the same location as stated in the EM&A Manual for consistency. No management approval is required at the ground floor for conducting the noise monitoring. This alternative air monitoring location was approved by EPD on 29 September 2020.

The Victoria Towers management office formally declined the proposal of setting up air quality and noise monitoring instruments on its premises at the podium area of Tower 1 (AM3/NM3) on 16 June 2020. Alternative air monitoring location was identified at ground floor at the Northeast corner of West Kowloon Station's station box (AM3A), in the same direction to the area of site activities in Zone 2A. This alternative air monitoring location was approved by EPD on 29 September 2020. An alternative noise monitoring location was identified at the ground floor in front of the Xiqu Centre (NM3A), which is set closer to the construction site boundary with more direct line sight to the major site activities and higher exposure to the construction noise with no disturbance to the premises' occupants during noise monitoring activities. No management approval is required at the ground floor for conducting the noise monitoring. This alternative air monitoring location was approved by EPD on 29 September 2020.

Canton Road Government Primary School formally declined the proposal of setting up air quality and noise monitoring instruments on its premise at the podium level (AM4/NM4) on 16 June 2020. Alternative air monitoring location was identified at ground floor at the Southeast corner of West Kowloon Station's station box (AM4A), in same direction to the area of site activities in Zone 2A. This alternative air monitoring location was approved by EPD on 29 September 2020. An alternative noise monitoring location was identified at the ground floor next to Tsim Sha Tsui Fire Station (NM4A), which is set closer to the construction site boundary with more direct line sight to the major site activities and higher exposure to the construction noise with no disturbance to the premises' occupants during noise monitoring activities. No management approval is required at the ground floor for conducting the noise monitoring. This alternative air monitoring location was approved by EPD on 29 September 2020.

MTR also formally declined the access to the designated AM5 location (topside developments at West Kowloon Terminus Site) on 15 July 2020. Alternative air monitoring location was identified at ground floor at the North of West Kowloon Station's station box (AM5A), in same direction to the area of major construction site activities in Zone 2A. This alternative air monitoring location was approved by EPD on 29 September 2020.

Grand Austin property management office formally declined our proposal of setting up noise monitoring instrument on its premises at the podium level (NM5) on 10 July 2020. Alternative noise monitoring location was identified at the Pedestrian road (ground floor) outside West Kowloon Station (NM5A), which is set closer to the construction site boundary with more direct line sight to the major site activities and higher exposure to the construction noise with no disturbance to the premises' occupants during noise monitoring activities. No management approval is required at the ground floor for conducting the noise monitoring. This alternative air monitoring location was approved by EPD on 29 September 2020.

The Environmental Quality Performance Limits for air quality and noise are shown in **Appendix C**.

The Event and Action Plan for air quality, construction noise, and landscape and visual are shown in **Appendix D**.

The EM&A programme followed the recommended mitigation measures in the EM&A Manual. The EM&A requirements as well as the summary of implementation status of the environmental mitigation measures are provided in **Appendix J**.

# 2 Impact Monitoring Methodology

## 2.1 Introduction

Air quality and noise monitoring methodology, including the monitoring locations, equipment used, parameters, frequency and duration etc., are described in this Section. The environmental monitoring schedules for the reporting period and the tentative monitoring Schedule for the coming month are provided in **Appendix E**.

The relevant EM&A monitoring requirements and details for landscape and audit impact, are also presented in this Section.

## 2.2 Air Quality

### 2.2.1 Monitoring Parameters, Frequency and Duration

**Table 2.1** summarizes the monitoring parameters, frequency and duration of the TSP monitoring.

**Table 2.1: Air Quality Monitoring Parameters, Frequency and Duration**

| Parameter | Frequency | Duration |
|---|---|---|
| 24-hour TSP | At least once in every six-days | 24 hours |
| 1-hour TSP | At least 3 times every six-days | 60 minutes |

### 2.2.2 Monitoring Locations

Monitoring stations and locations are given in **Table 2.2** and shown in **Figure 1**.

**Table 2.2: Air Quality Monitoring Station**

| Monitoring Station | Location Description |
|---|---|
| AM3A | Northeast corner of West Kowloon Station's station box (G/F) |
| AM4A | Southeast corner of West Kowloon Station's station box (G/F) |
| AM5A | North of West Kowloon Station's station box (G/F) |

### 2.2.3 Monitoring Equipment

Continuous 24-hour TSP air quality monitoring was conducted using High Volume Sampler (HVS) (Model: TE-5170) located at the designated monitoring station. The HVS meets all the requirements stated in of the EM&A Manual. Portable direct reading dust meter was used to carry out the 1-hour TSP monitoring. **Table 2.3** summarizes the equipment used in the impact air quality monitoring. Copies of the calibration certificates for the HVS, calibration kit and portable dust meters are attached in **Appendix F**.

**Table 2.3: TSP Monitoring Equipment**

| Equipment | Model |
|---|---|
| **24-hour TSP monitoring** | |
| High Volume Sampler | TE-5170 (Serial No.: 4340; 3998; 4344) |

| Equipment | Model |
|---|---|
| Calibrator | TE-5025A (Orifice I.D.: 4088) |
| **1-hour TSP monitoring** | |
| Portable direct reading dust meter | Sibata LD-3B (Serial No.: 235811, 336338, 567188) |

Calibration of the HVS (five-point calibration) using Calibration Kit was carried out every two months. The HVS calibration orifice will be calibrated annually. Calibration certificate of the TE-5025A Calibration Kit and the HVS are provided in **Appendix F**.

The 1-hour TSP monitoring should be determined periodically (e.g. annually) by the HVS to check the validity and accuracy of the results measured by direct reading method.

### 2.2.4 Monitoring Methodology

**24-hour TSP Monitoring**

**Installation**

The HVS was installed at the site boundary. The following criteria were considered in the installation of the HVS.

- A horizontal platform with appropriate support to secure the sampler against gusty wind was provided.
- The distance between the HVS and any obstacles, such as buildings, was at least twice the height that the obstacle protrudes above the HVS.
- A minimum of 2 metres separation from walls, parapets and penthouse was required for rooftop sampler.
- A minimum of 2 metres separation from any supporting structure, measured horizontally was required.
- No furnace or incinerator flues or building vent were nearby.
- Airflow around the sampler was unrestricted.
- The sampler has been more than 20 metres from any drip line.
- Permission was obtained to set up the sampler and to obtain access to the monitoring station.
- A secured supply of electricity is needed to operate the sampler.

**Preparation of Filter Papers**

- Glass fibre filters were labelled and sufficient filters that were clean and without pinholes were selected.
- The filters used are specified to have a minimum collection efficiency of 99 percent for 0.3 μm (DOP) particles.
- All filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than ±3 °C with relative humidity (RH) < 50% and was not variable by more than ±5 %. A convenient working RH was 40%. All preparation of filters was done by Hong Kong Laboratory Accreditation Scheme (HOKLAS) accredited laboratory.

**Field Monitoring Procedures**

- The power supply was checked to ensure the HVS works properly.
- The filter holder and the area surrounding the filter were cleaned.

- The filter holder was removed by loosening the four bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully.
- The filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter.
- The swing bolts were fastened to hold the filter holder down to the frame. The pressure applied should be sufficient to avoid air leakage at the edges.
- The shelter lid was closed and was secured with the aluminium strip.
- The HVS was warmed-up for about 5 minutes to establish run-temperature conditions.
- A new flow rate record sheet was set into the flow recorder.
- The flow rate of the HVS was checked and adjusted at around 1.3 $m^3$/min. The range specified in the EM&A Manual was between 0.6-1.7 $m^3$/min.
- The programmable timer was set for a sampling period of 24 hours, and the starting time, weather condition and the filter number were recorded.
- The initial elapsed time was recorded.
- At the end of sampling, the sampled filter was removed carefully and folded in half length so that only surfaces with collected particulate matter were in contact.
- It was then placed in a clean plastic envelope and sealed.
- All monitoring information was recorded on a standard data sheet.
- Filters were sent to a Hong Kong Laboratory Accreditation Scheme (HOKLAS) accredited laboratory for analysis.

**Maintenance and Calibration**

- The HVS and its accessories are maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply.
- HVSs were calibrated upon installation and thereafter at bi-monthly intervals. The calibration kits were calibrated annually.
- Calibration records for HVS and calibration kit are shown in **Appendix F**.

**1-hour TSP Monitoring**

**Field Monitoring**

The measuring procedures of the 1-hour dust meter are in accordance with the Manufacturer's Instruction Manual as follows:

- Turn the power on.
- Close the air collecting opening cover.
- Push the "TIME SETTING" switch to [BG].
- Push "START/STOP" switch to perform background measurement for 6 seconds.
- Turn the knob at SENSI ADJ position to insert the light scattering plate.
- Leave the equipment for 1 minute upon "SPAN CHECK" is indicated in the display.
- Push "START/STOP" switch to perform automatic sensitivity adjustment. This measurement takes 1 minute.
- Pull out the knob and return it to MEASURE position.
- Setting time period of 1 hour for the 1-hour TSP measurement.
- Push "START/STOP" to start the 1-hour TSP measurement.
- Regular checking of the time period setting to ensure monitoring time of 1 hour.

**Maintenance and Calibration**

- The 1-hour dust meter would be checked at 3-month intervals and calibrated at 1-year intervals throughout all stages of the air quality monitoring.
- Calibration records for direct dust meters are shown in **Appendix F**.

**Weather Condition**

- Meteorological data extracted from Hong Kong Observatory for the reporting month is provided in **Appendix H**.

## 2.3 Noise

### 2.3.1 Monitoring Parameters, Frequency and Duration

**Table 2.4** summarizes the monitoring parameters, frequency and duration of noise monitoring. The noise in A-weighted levels $L_{eq}$, $L_{10}$ and $L_{90}$ are recorded in a 30-minute interval between 0700 and 1900 hours.

**Table 2.4: Noise Monitoring Parameters, Period and Frequency**

| Time Period | Parameters | Frequency |
|---|---|---|
| Daytime on normal weekdays (0700-1900 hours) | $L_{eq}$(30 min), $L_{90}$(30 min) & $L_{10}$(30 min) | Once every week |

Note: *70 dB(A) for schools and 65 dB(A) during school examination periods.
If works are to be carried out during restricted hours, the conditions stipulated in the Construction Noise Permit (CNP) issued by the Noise Control Authority have to be followed.

### 2.3.2 Monitoring Location

Noise monitoring stations and locations are given in **Table 2.5** and shown in **Figure 1**.

**Table 2.5: Noise Monitoring Station**

| Monitoring Station | Location |
|---|---|
| NM2A | The Arch – Sun Tower (G/F) |
| NM3A | Xiqu Centre (G/F) |
| NM4A | Next to Tsim Sha Tsui Fire Station (G/F) |
| NM5A | Pedestrian road (G/F) outside West Kowloon Station |

### 2.3.3 Monitoring Equipment

Integrating Sound Level Meter was used for noise monitoring. It was a Type 1 sound level meter capable of giving a continuous readout of the noise level readings including equivalent continuous sound pressure level ($L_{Aeq}$) and percentile sound pressure level ($L_x$). They comply with International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1). **Table 2.6** summarizes the noise monitoring equipment model being used.

**Table 2.6: Noise Monitoring Equipment**

| Equipment Model | |
|---|---|
| **Integrating Sound Level Meter** | **Calibrator** |
| AWA5661 (Serial No.: 301135) | Quest QC-10 (Serial No.: Q19010183) |

### 2.3.4 Monitoring Methodology

**Field Monitoring**

- The microphone of the Sound Level Meter was set at least 1.2 m above the ground.
- Free Field measurement was made at NM5A monitoring location.
- The battery condition was checked to ensure the correct functioning of the meter.
- Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:
  - frequency weighting: A
  - time weighting: Fast
  - time measurement: 30 minutes intervals (between 0700-1900 on normal weekdays)
- Prior to and after each noise measurement, the meter was calibrated using a Calibrator for 94 dB at 1 kHz. If the difference in the calibration level before and after measurement was more than 1 dB, the measurement would be considered invalid and has to be repeated after re-calibration or repair of the equipment.
- During the monitoring period, the $L_{eq}$, $L_{10}$ and $L_{90}$ were recorded. In addition, any site observations and noise sources were recorded on a standard record sheet.
- A correction of +3dB(A) was made to the free field measurements.

**Maintenance and Calibration**

- The microphone head of the sound level meter and calibrator is cleaned with soft cloth at quarterly intervals.
- The sound level meter and calibrator are sent to the supplier or HOKLAS laboratory to check and calibrate at yearly intervals.
- Calibration records are shown in **Appendix F**.

**Weather Condition**

- Meteorological data extracted from Hong Kong Observatory for the reporting month is provided in **Appendix H**.

## 2.4 Landscape and Visual

### 2.4.1 Monitoring Program

**Table 2.7** details the monitoring program (as proposed in the WKCD EIA report) for landscape and visual impact during the construction phase.

**Table 2.7: Monitoring Program for Landscape and Visual Impact during Construction Phase**

| Stage | Monitoring Task | Frequency | Report | Approval |
|---|---|---|---|---|
| Construction | Monitor implementation of proposed mitigation measures during the construction stage. | Bi-weekly | ET to report on Contractor's compliance | Counter-signed by IEC |

During the landscape and visual impact monitoring, any changes in relation to the landscape and visual amenity should be monitored with reference to the baseline conditions of the site. In addition, mitigation measures were proposed in the WKCD EIA report to minimise the landscape and visual impacts during the construction phase. The proposed mitigation measures as shown in Table 9.1 and Table 9.2 of the EM&A Manual should be checked for proper implementation.

# 3 Monitoring Results

## 3.1 Impact Monitoring

Air quality, noise and landscape and visual impact monitoring was undertaken in compliance with the EM&A Manual during the reporting month.

## 3.2 Air Quality Monitoring

### 3.2.1 1-hour TSP

Results of 1-hour TSP are summarised in **Table 3.1**. Graphical plots of the monitoring results are shown in **Appendix G**.

**Table 3.1: Summary of 1-hour TSP monitoring results**

| Monitoring Station | Monitoring Date | Start Time | 1-hour TSP (µg/m3) | | | Range (µg/m3) | Action Level (µg/m3) | Limit Level (µg/m3) |
|---|---|---|---|---|---|---|---|---|
| | | | 1st Result | 2nd Result | 3rd Result | | | |
| AM3A | 03-Apr-24 | 14:07 | 58 | 53 | 54 | 39-58 | 280.4 | 500 |
| | 06-Apr-24 | 08:09 | 41 | 41 | 44 | | | |
| | 12-Apr-24 | 14:05 | 44 | 42 | 43 | | | |
| | 18-Apr-24 | 08:00 | 47 | 45 | 45 | | | |
| | 24-Apr-24 | 14:02 | 45 | 44 | 39 | | | |
| | 30-Apr-24 | 08:02 | 43 | 41 | 46 | | | |
| AM4A | 03-Apr-24 | 14:15 | 60 | 60 | 60 | 36-60 | 278.5 | 500 |
| | 06-Apr-24 | 08:17 | 48 | 41 | 44 | | | |
| | 12-Apr-24 | 14:13 | 44 | 36 | 43 | | | |
| | 18-Apr-24 | 08:08 | 42 | 48 | 47 | | | |
| | 24-Apr-24 | 14:10 | 40 | 38 | 42 | | | |
| | 30-Apr-24 | 08:10 | 48 | 48 | 42 | | | |
| AM5A | 03-Apr-24 | 14:30 | 52 | 56 | 53 | 36-56 | 275.4 | 500 |
| | 06-Apr-24 | 08:34 | 48 | 41 | 42 | | | |
| | 12-Apr-24 | 14:28 | 36 | 38 | 45 | | | |
| | 18-Apr-24 | 08:25 | 50 | 41 | 46 | | | |
| | 24-Apr-24 | 14:25 | 41 | 42 | 39 | | | |
| | 30-Apr-24 | 08:27 | 44 | 44 | 47 | | | |

### 3.2.2 24-hour TSP

Results of 24-hour TSP are summarised in **Table 3.2**. Graphical plots of the monitoring results are shown in **Appendix G**.

**Table 3.2: Summary of 24-hour TSP monitoring results**

| Monitoring Station | Monitoring Date | Start Time | Monitoring Results (µg/m$^3$) | Range (µg/m$^3$) | Action Level (µg/m$^3$) | Limit Level (µg/m$^3$) |
|---|---|---|---|---|---|---|
| AM3A | 03-Apr-24 | 10:00 | 49.4 | 40.3-49.4 | 152.4 | 260 |

| Monitoring Station | Monitoring Date | Start Time | Monitoring Results (μg/m³) | Range (μg/m³) | Action Level (μg/m³) | Limit Level (μg/m³) |
|---|---|---|---|---|---|---|
| | 06-Apr-24 | 10:00 | 41.9 | | | |
| | 12-Apr-24 | 10:00 | 40.3 | | | |
| | 18-Apr-24 | 10:00 | 42.9 | | | |
| | 24-Apr-24 | 10:00 | 41.0 | | | |
| | 30-Apr-24 | 10:00 | 41.9 | | | |
| AM4A | 03-Apr-24 | 10:00 | 55.9 | 39.9-55.9 | 152.6 | 260 |
| | 06-Apr-24 | 10:00 | 42.2 | | | |
| | 12-Apr-24 | 10:00 | 39.9 | | | |
| | 18-Apr-24 | 10:00 | 43.2 | | | |
| | 24-Apr-24 | 10:00 | 40.9 | | | |
| | 30-Apr-24 | 10:00 | 44.2 | | | |
| AM5A | 03-Apr-24 | 10:00 | 46.3 | 38.4-46.3 | 141.1 | 260 |
| | 06-Apr-24 | 10:00 | 42.9 | | | |
| | 12-Apr-24 | 10:00 | 38.4 | | | |
| | 18-Apr-24 | 10:00 | 42.9 | | | |
| | 24-Apr-24 | 10:00 | 39.9 | | | |
| | 30-Apr-24 | 10:00 | 38.8 | | | |

No exceedance of 1-hour and 24-hour TSP (Action or Limit Level) was recorded in the reporting period.

## 3.3 Noise Monitoring

The construction noise monitoring results are summarized in **Table 3.3**. Graphical plots of the monitoring data and the station set-up as façade and free-field measurements are shown in **Appendix G**.

**Table 3.3: Summary of noise monitoring results during normal weekdays**

| Monitoring Stations | Monitoring Date | Start Time | End Time | $L_{eq}$ (30 mins) dB(A) | Limit Level for $L_{eq}$ (dB(A)) |
|---|---|---|---|---|---|
| NM2A | 03-Apr-24 | 14:37 | 15:07 | 61.5 | 75 |
| | 06-Apr-24 | 08:39 | 09:09 | 61.1 | |
| | 12-Apr-24 | 14:35 | 15:05 | 61.5 | |
| | 18-Apr-24 | 08:30 | 09:00 | 61.2 | |
| | 24-Apr-24 | 14:32 | 15:02 | 61.2 | |
| | 30-Apr-24 | 08:32 | 09:02 | 61.5 | |
| NM3A | 03-Apr-24 | 16:07 | 16:37 | 60.5 | 75 |
| | 06-Apr-24 | 10:12 | 10:42 | 60.9 | |
| | 12-Apr-24 | 16:05 | 16:35 | 61.1 | |
| | 18-Apr-24 | 10:03 | 10:33 | 60.4 | |
| | 24-Apr-24 | 16:02 | 16:32 | 60.6 | |
| | 30-Apr-24 | 10:14 | 10:44 | 61.0 | |
| NM4A | 03-Apr-24 | 16:42 | 17:12 | 58.1 | 70/65^# |
| | 06-Apr-24 | 10:47 | 11:17 | 58.3 | |
| | 12-Apr-24 | 16:40 | 17:10 | 58.4 | |
| | 18-Apr-24 | 10:38 | 11:08 | 57.8 | |

| Monitoring Stations | Monitoring Date | Start Time | End Time | $L_{eq}$ (30 mins) dB(A) | Limit Level for $L_{eq}$ (dB(A)) |
|---|---|---|---|---|---|
| | 24-Apr-24 | 16:37 | 17:07 | 58.3 | |
| | 30-Apr-24 | 10:49 | 11:19 | 58.0 | |
| NM5A* | 03-Apr-24 | 15:27 | 15:57 | 63.6 | 75 |
| | 06-Apr-24 | 09:31 | 10:01 | 63.5 | |
| | 12-Apr-24 | 15:25 | 15:55 | 63.2 | |
| | 18-Apr-24 | 09:22 | 09:52 | 63.6 | |
| | 24-Apr-24 | 15:22 | 15:52 | 63.6 | |
| | 30-Apr-24 | 09:33 | 10:03 | 63.7 | |

Remarks:

* +3dB (A) correction was applied to free-field measurement.

^ 70 dB(A) for schools and 65 dB(A) during school examination periods.

# School examination was conducted on 11 to 13, 15 to 19, 24 to 25 and 29 April 2024 in the reporting period.

No exceedance of Construction Noise (Action or Limit Level) was recorded in the reporting month

School examination was conducted on 11 to 13, 15 to 19, 24 to 25 and 29 April 2024 during the reporting period. Additional monitoring was carried out at NM4A on the examination date on 11, 13, 15 to 17, 19, 25 and 29 April 2024 and the $L_{eq}$ (5 mins) is in the range of 57.6-59.0 dB(A).

## 3.4 Landscape and Visual Impact

Landscape and visual impact inspections were conducted as part of the weekly site inspections on 10 and 24 April 2024 for Zone 2B & 2C during the reporting month. As reviewed by the registered Landscape Architect, no adverse comment on landscape and visual aspects was made during these inspections.

The landscape and visual mitigation measures were implemented during the reporting period. The summary of implementation status of the environmental mitigation measures is provided in **Appendix J**.

# 4 Site Environmental Management

## 4.1 Site Inspection

### 4.1.1 Zone 2B & 2C

Construction phase weekly site inspections were carried out on 03, 10, 17 and 24 April 2024 at Zone 2B & 2C. The joint site inspection with IEC, ET, ER and Contractor for Zone 2B & 2C was held on 10 April 2024. All observations have been recorded in the site inspection checklist and passed to the Contractor together with the appropriate recommended mitigation measures where necessary.

The key observations from the site inspections and associated recommendations are summarized in **Table 4.1**.

**Table 4.1: Summary of Site Inspections and Recommendations for Zone 2B & 2C**

| Inspection Date | Parameter | Observation / Recommendation | Contactor's Responses / Action(s) Undertaken | Close-out (Date) |
|---|---|---|---|---|
| 03-Apr-24 | Air Quality | The contractor was reminded that dust suppression measures shall be strengthened at the access road or construction areas to minimize dust impact. | The contractor has sprayed water near working areas. | 05-Apr-24 |
| 10-Apr-24 | Air Quality | The contractor was reminded that dust suppression measures shall be strengthened at the access road to minimize dust impact. | The contractor has sprayed water at access road by water sprinklers. . | 11-Apr-24 |

## 4.2 Advice on the Solid and Liquid Waste Management Status

The Contractors have been registered as a chemical waste producer for the Project. Construction and demolition (C&D) material sorting will be carried out on site. A sufficient number of receptacles were available for general refuse collection.

### 4.2.1 Zone 2B & 2C

As advised by the Zone 2B & 2C Contractor, 357.93 tonnes and 51.73 tonnes of inert C&D material were disposed of as public fill to Tseung Kwan O Area 137 Public Fill and Tuen Mun Area 38 Public Fill respectively, while 22.61 tonnes of general refuse were disposed of at SENT landfill. 0.0 tonne of metals, 0.0 tonne of paper/cardboard packaging, 0.0 tonne of plastics and 0.0 tonne of timber was collected by recycling contractors in the reporting month. 0.0 tonne of inert C&D material were reused on site. 0.0 tonne of inert C&D material were reused in other projects and 0.0 tonne of inert C&D material was imported for reuse at site in the reporting month. 0.0 tonne of inert C&D material was disposed to sorting facility and 0.0 tonne of chemical waste was collected by licensed contractors in the reporting period.

The cumulative waste generation records for Zone 2B & 2C are shown in **Appendix I**.

## 4.3 Status of Environmental Licenses and Permits

### 4.3.1 Zone 2B & 2C

The environmental permits, licenses, and/or notifications on environmental protection for this Project which were valid during the period are summarised in **Table 4.2**.

**Table 4.2: Status of Environmental Submissions, Licenses and Permits for Zone 2B & 2C**

| Permit / License No. / Notification / Reference No. | Valid Period | | Status | Remarks |
|---|---|---|---|---|
| | From | To | | |
| **Chemical Waste Producer Registration** | | | | |
| WPN5113-256-V2302-01 | 17-Aug-21 | -- | Valid | -- |
| **Billing Account Construction Waste Disposal** | | | | |
| 7041264 | 11-Aug-21 | -- | Account Active | -- |
| **Construction Noise Permit** | | | | |
| GW-RE0237-24 | 24-Mar-24 | 23-Sep-24 | Valid | -- |
| **Wastewater Discharge License** | | | | |
| WT00039734-2021 | 25-Nov-21 | 30-Nov-26 | Valid | -- |
| **Notification under Air Pollution Control (Construction Dust) Regulation** | | | | |
| 497583 | 28-Sep-23 | -- | Notified | -- |

## 4.4 Recommended Mitigation Measures

The EM&A programme followed the recommended mitigation measures in the EM&A Manual. The EM&A requirements as well as the summary of implementation status of the environmental mitigation measures are provided in **Appendix J**. In particular, the following mitigation measures were brought to attention during the site inspections:

### 4.4.1 Zone 2B & 2C

**Air Quality**

- Dust suppression measures should be strengthened on site.

**Waste Management**

- Fuel drums should be properly placed with drip trays/removed to storage area to prevent chemical spillage.
- General refuse should be disposed at designated area frequently to avoid accumulation on site.

**Temporary Water Drainage System & Water Quality**

- Temporary drainage system shall be maintained regularly to ensure efficient operation.
- Idle stockpile of construction materials should be fully covered with tarpaulin when not being used or removed from the site during rainstorm.

# 5 Compliance with Environmental Permit

The status of the required submission under the EP during the reporting period is summarized in **Table 5.1**.

**Table 5.1: Status of Submissions under the Environmental Permit**

| EP Condition | Submission | Submission Date |
|---|---|---|
| Condition 3.4 | Monthly EM&A Report for March 2024 | 12 April 2024 |

# 6 Report in Non-compliance, Complaints, Notification of Summons and Successful Prosecutions

## 6.1 Record on Non-compliance of Action and Limit Levels

There was no breach of Action or Limit levels for Air Quality (1-hour TSP and 24-hour TSP) and Construction Noise in this reporting month.

## 6.2 Record on Environmental Complaints Received

No environmental complaint was received in the reporting month.

The cumulative statistics on complaints were provided in **Appendix K**.

## 6.3 Record on Notifications of Summons and Successful Prosecution

No notifications of summons or successful prosecutions were received this month. The cumulative statistics on notifications of summons and successful prosecutions were provided in **Appendix K**.

# 7 Future Key Issues

## 7.1 Construction Works for the Coming Month(s)

The major site works for Zone 2B & 2C scheduled to be commissioned in the coming month include:

- Site Maintenance
- Backfilling of Testing Pipes
- Pile Testing
  - Full Core Drilling

## 7.2 Key Issues for the Coming Month

### 7.2.1 Zone 2B & 2C

Key issues to be considered in the coming month include:

- Generation of dust from construction works;
- Noise impact from general site works;
- Generation of site surface runoffs and wastewater from activities on-site;
- Management of stockpiles and slopes, particularly on rainy days;
- Sorting, recycling, storage and disposal of general refuse and construction waste; and
- Management of chemicals and avoidance of oil spillage on-site.

## 7.3 Monitoring Schedule for the Coming Month

The environmental site inspection and environmental monitoring will be continued in the coming month. The tentative monitoring schedule for the coming month is shown in the **Appendix E**.

# 8 Conclusions and Recommendations

## 8.1 Conclusions

The EM&A programme as recommended in the EM&A Manual has been undertaken with the commencement of the construction activities at Zone 2A and Zone 2B & 2C on 03 October 2020 and 30 September 2021 respectively; and the construction work for Zone 2A (Contract No.: GW/2020/05/073) was completed and handover to WKCDA on 31 March 2023. No construction work and only maintenance work was carried out by Zone 2B & 2C Contractor at Zone 2A.

Monitoring of air quality and noise with respect to the Projects is underway. In particular, the 1-hour TSP, 24-hour TSP, Noise Level (as $L_{eq}$, 30 minutes) under monitoring have been checked against established Action and Limit levels. There was no breach of Action or Limit levels for Air Quality (1-hour TSP and 24-hour TSP) and Construction Noise in this reporting month.

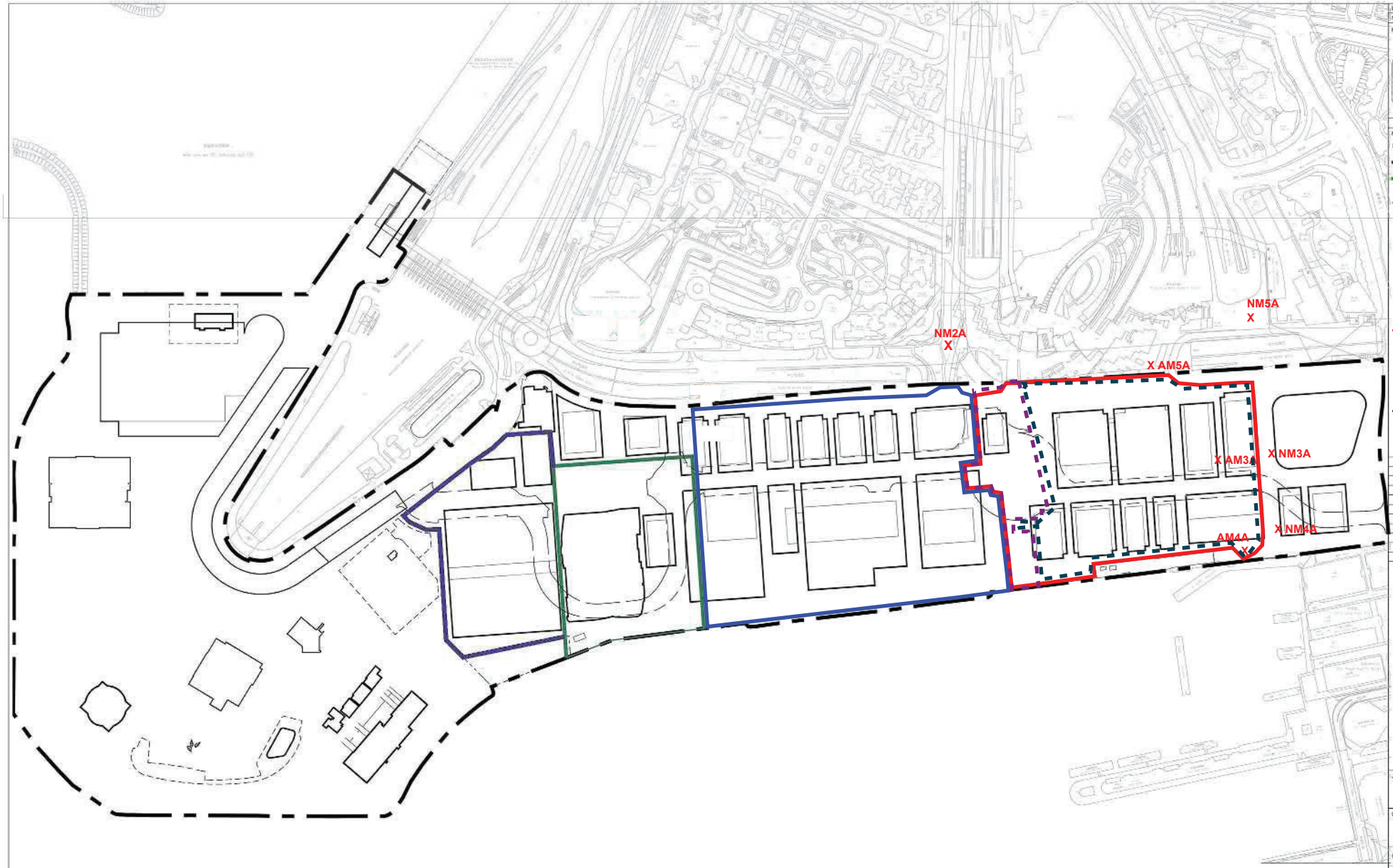
No environmental complaint was recorded in the reporting month. No notifications of summons or successful prosecutions were received during the reporting month.

Weekly construction phase site inspections and bi-weekly landscape and visual impact inspections were conducted during the reporting month as required. It was observed that the Contractors had implemented all possible and feasible mitigation measures to mitigate the potential environmental impacts during construction phase works.

## 8.2 Recommendations

Potential environmental impacts due to the construction activities, including air quality, noise, water quality, waste, landscape and visual, will be monitored or reviewed. The recommended environmental mitigation measures shall be implemented on site and regular inspections as required will be carried out to ensure that the environmental conditions are acceptable.

# Figure 1 Site Layout Plan and Monitoring Stations




B.D. REF:

H.S.D. REF:

KEY PLAN

KEY PLAN

NOTES:

WKCD BOUNDARY

M+ MUSEUM BOUNDARY

LYRIC THEATRE BOUNDARY

BOUNDARY OF UNDERPASS ROAD SERVING THE PLANNED WKCD

X CONSTRUCTION AIR/NOISE MONITORING STATION

REMARKS:
THE AIR MONITORING STATION AM2A HAS BEEN RELOCATED TO THE ALTERNATIVE MONITORING STATION AM2B AT 1ST FLOOR OF GAMMON'S SITE OFFICE ON 26 FEBRUARY 2019.

Zone 2A Boundary

Zone 2B & 2C Boundary

Under Management by Zone 2B & 2C Contractor Starting from 20 Dec 2022

No Construction Work and Only Maintenance Work is Carried Out by Zone 2B & 2C Contractor Starting from 01 April 2023

| REV. | DATE | DESCRIPTION | INITIAL |
|---|---|---|---|

JOB TITLE: **DEVELOPMENT AT WEST KOWLOON CULTURAL DISTRICT**

DRAWING TITLE: **SITE LAYOUT PLAN AND MONITORING STATIONS**

| | | | |
|---|---|---|---|
| SCALE: | 1:100 | PRINTED: | A1 |
| CHECKED: | | DATE: | |
| APPROVED: | | DATE: | |
| DRAWN: | TY | DATE: | 05-05-2015 |

CONTRACT NO.: -

DRAWING NO.: **FIGURE 1**

REV.: XX

CAD REF NAME: XXXXX-AUT-PMS DWG-P60-L080-0080-XXX.dwg

AUTHORITY:

westKowloon
西九文化區

A1 (841mm x 594mm) Sheet Size

# Appendices

A. Project Organisation
B. Tentative Construction Programme
C. Action and Limit Levels for Construction Phase
D. Event and Action Plan for Air Quality, Noise, Landscape and Visual Impact
E. Monitoring Schedule
F. Calibration Certifications
G. Graphical Plots of the Monitoring Results
H. Meteorological Data Extracted from Hong Kong Observatory
I. Waste Flow table
J. Environmental Mitigation Measures – Implementation Status
K. Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions

# A. Project Organisation

# Project Organization

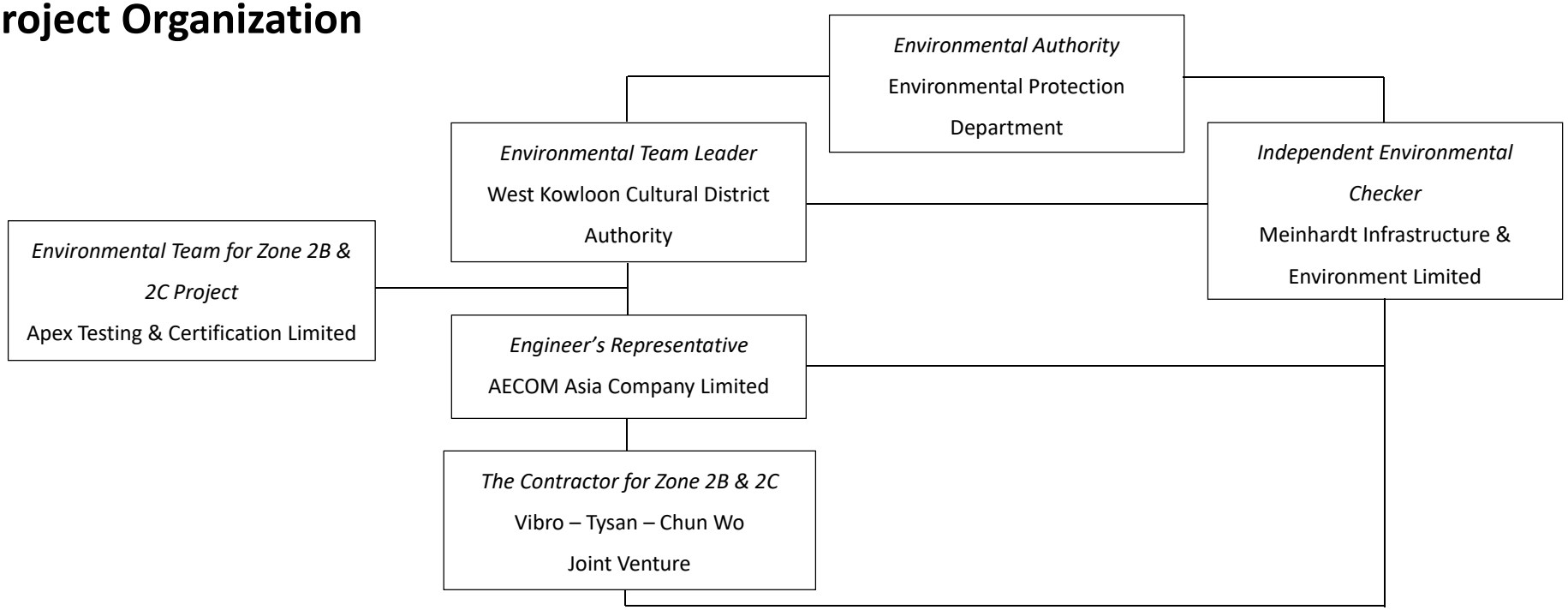


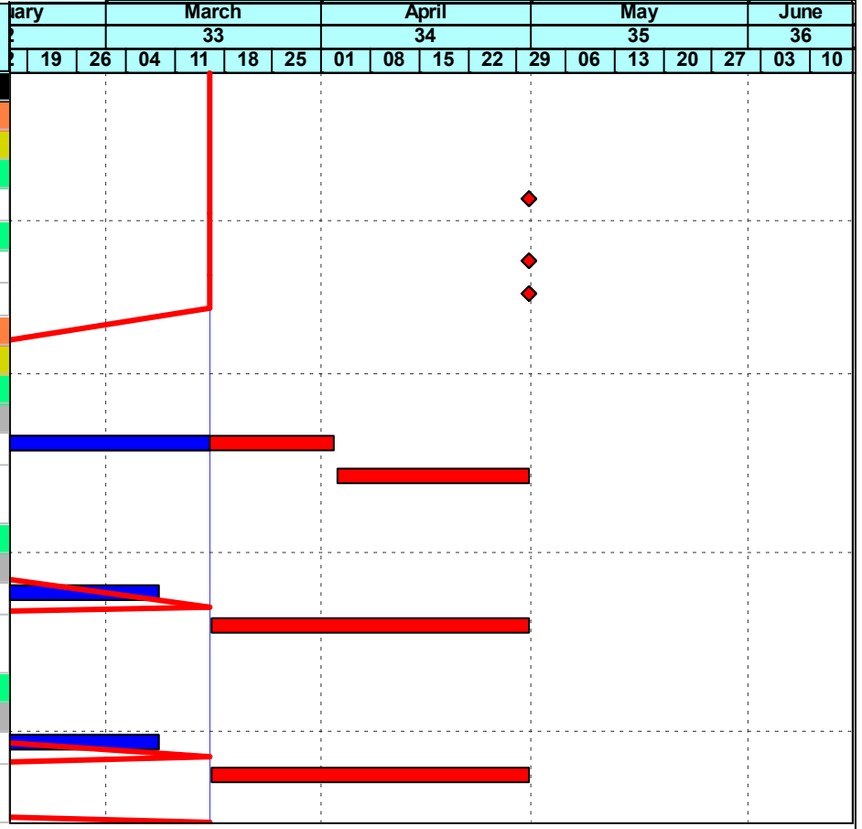

**Table A-1: Contract Information**

| Company Name | Role | Name | Telephone | Email |
|---|---|---|---|---|
| West Kowloon Cultural District Authority | WKCDA Representative & Project ETL | Mr. C.K. WU | 5506 9178 | ck.wu@wkcda.hk |
| Meinhardt Infrastructure & Environment Limited | Independent Environmental Checker | Ms. Claudine LEE | 2859 5409 | caludinelee@meinhardt.com.hk |
| AECOM Asia Company Limited | Assistant Resident Engineer (Zone 2B & 2C) | Mr. Laurence WONG | 5791 8711 | cheuklunlaurence.wong@aecom.com |
| Vibro – Tysan – Chun Wo Joint Venture | Environmental Sustainability Manager | Mr. Tony YAM | 2137 5586 | tony_yam@vibro.com.hk |
| Apex Testing & Certification Limited | Contractor's Environmental Team Leader | Mr. Calvin LUI | 9629 9718 | calvinlui@apextestcert.com |

# B. Tentative Construction Programme

# Zone 2B & 2C

| Activity ID | Activity Name | Baseline Start | Baseline Finish | Dur | Forecast / Actual Start | Forecast / Actual Finsih | Total Float |
|---|---|---|---|---|---|---|---|
| **Piling for Integrated Basement and U/G Road in Zone 2B & 2C** | | | | | | | |
| **Contract Dates** | | | | | | | |
| **Key Dates** | | | | | | | |
| **KD for Zone 2B** | | | | | | | |
| KD07 | KD07 (Section 3) - 30 Sep 2023 | | 13-Dec-23 | 0 | | 30-Apr-24* | -213 |
| **KD for Zone 2C** | | | | | | | |
| KD08 | KD08 (Section 4) - 23 May 2023 | | 13-Aug-23 | 0 | | 30-Apr-24* | -343 |
| KD09 | KD09 (Section 5) - 12 Jun 2023 | | 14-Oct-23 | 0 | | 30-Apr-24* | -323 |
| **Construction Stage** | | | | | | | |
| **Pile Test** | | | | | | | |
| **KD07 (Section 3) (incl. BP for KD03) (Stage 3-1)** | | | | | | | |
| **BP** | | | | | | | |
| KD07.TS.1060 | Full Core to Proof Drill | 02-Nov-23 | 15-Nov-23 | 72 | 22-Jan-24 A | 02-Apr-24 | -213 |
| KD07.TS.1080 | Obtain BA14 Acknowledgement / Satisfaction of CA, Completion As-built Drawings, Reports & Records | 16-Nov-23 | 13-Dec-23 | 28 | 03-Apr-24 | 30-Apr-24 | -213 |
| **KD08 (Section 4) (incl. BP for KD04 (Stage 4-1) & SSHP in KD09 (Section 5))** | | | | | | | |
| **BP** | | | | | | | |
| KD08.TS.1060 | Full Core to Proof Drill | 03-Jul-23 | 16-Jul-23 | 106 | 24-Nov-23 A | 08-Mar-24 A | |
| KD08.TS.1080 | Obtain BA14 Acknowledgement / Satisfaction of CA, Completion As-built Drawings, Reports & Records | 17-Jul-23 | 13-Aug-23 | 46 | 16-Mar-24 | 30-Apr-24 | -343 |
| **KD09 (Section 5) (incl. BP for KD02 (Stage 5-1))** | | | | | | | |
| **BP** | | | | | | | |
| KD09.TS.1060 | Full Core to Proof Drill | 03-Sep-23 | 16-Sep-23 | 59 | 10-Jan-24 A | 08-Mar-24 A | |
| KD09.TS.1080 | Obtain BA14 Acknowledgement / Satisfaction of CA, Completion As-built Drawings, Reports & Records | 17-Sep-23 | 14-Oct-23 | 46 | 16-Mar-24 | 30-Apr-24 | -323 |




ID: 2BC-20240315
Data Date: 16-Mar-24
Print Date: 20-Mar-24_17:06
Page 1 of 1

Planned
Critical
Actual
Planned MS
Critical MS
Actual MS

**West Kowloon Cultural District Authority**
**Piling for Integrated Basement and U/G Road in Zone 2B 2C**
**3 Month Rolling Programme as of 15 March 2024**
**Based on CMWP Rev.0 (3rd Draft)**

| Date | Revision | Checked | Approved |
|---|---|---|---|
| 04-Mar-22 | R0 | KL | B |
| 02-Dec-22 | R03D | KL | C |

# C. Action and Limit Levels for Construction Phase

## Air Quality

The Action and Limit Levels for 1-hour and 24-hour TSP for the monitoring stations are presented in following tables:

**Table C-1: Action and Limit Levels for 1-hour TSP**

| Monitoring Station | Action Level (µg/m3) | Limit Level (µg/m3) |
|---|---|---|
| AM3A | 280.4 | 500 |
| AM4A | 278.5 | 500 |
| AM5A | 275.4 | 500 |

**Table C-2: Action and Limit Levels for 24-hour TSP**

| Monitoring Station | Action Level (µg/m3) | Limit Level (µg/m3) |
|---|---|---|
| AM3A | 152.4 | 260 |
| AM4A | 152.6 | 260 |
| AM5A | 141.1 | 260 |

## Noise

The Action and Limit Levels for Noise for the monitoring stations are presented in following table:

**Table C-3: Action and Limit Levels for Construction Noise**

| Time Period & Monitoring Locations | Action Level | Limit Level |
|---|---|---|
| NM2A, NM3A, NM4A and NM5A | | |
| 0700-1900 hours on normal weekdays | When one valid documented complaint is received from any one of the sensitive receiver | 75 |

Note:

*Reduce to 70dB(A) for school and 65 dB(A) during school examination period.

# D. Event and Action Plan for Air Quality, Noise, Landscape and Visual Impact

## Air Quality

In case the Action and Limit Levels are not complied during construction stage, the following Event and Action Plan should be followed:

**Table D-1: Typical Event and Action Plan for Air Quality**

| Event | Action | | | |
|---|---|---|---|---|
| | ET | IEC | WKCDA | Contractor |
| **Action Level** | | | | |
| 1. Exceedance for one sample | 1. Identify source, investigate the causes of exceedance and propose remedial measures;<br>2. Inform IEC and WKCDA;<br>3. Repeat measurement to confirm finding;<br>4. Increase monitoring frequency to daily. | 1. Check monitoring data submitted by ET;<br>2. Check Contractor's working method. | 1. Notify Contractor | 1. Rectify any unacceptable practice;<br>2. Amend working methods if appropriate. |
| 2. Exceedance for two or more consecutive samples | 1. Identify source;<br>2. Inform IEC and WKCDA;<br>3. Advise the WKCDA on the effectiveness of the proposed remedial measures;<br>4. Repeat measurements to confirm findings;<br>5. Increase monitoring frequency to daily;<br>6. Discuss with IEC and Contractor on remedial actions required;<br>7. If exceedance continues, arrange meeting with IEC and WKCDA;<br>8. If exceedance stops, cease additional monitoring. | 1. Check monitoring data submitted by ET;<br>2. Check Contractor's working method;<br>3. Discuss with ET and Contractor on possible remedial measures;<br>4. Advise the ET on the effectiveness of the proposed remedial measures;<br>5. Monitor the implementation of remedial measures. | 1. Confirm receipt of notification of failure in writing;<br>2. Notify Contractor;<br>3. Ensure remedial measures properly implemented. | 1. Submit proposals for remedial to WKCDA within three working days of notification;<br>2. Implement the agreed proposals;<br>3. Amend proposal if appropriate. |

| Event | Action | | | |
|---|---|---|---|---|
| | ET | IEC | WKCDA | Contractor |
| **Limit Level** | | | | |
| 1. Exceedance for one sample | 1. Identify source, investigate the causes of exceedance and propose remedial measures;<br>2. Inform WKCDA, Contractor and EPD;<br>3. Repeat measurement to confirm finding;<br>4. Increase monitoring frequency to daily;<br>5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and WKCDA informed of the results. | 1. Check monitoring data submitted by ET;<br>2. Check Contractor's working method;<br>3. Discuss with ET and Contractor on possible remedial measures;<br>4. Advise the WKCDA on the effectiveness of the proposed remedial measures;<br>5. Monitor the implementation of remedial measures. | 1. Confirm receipt of notification of failure in writing;<br>2. Notify Contractor;<br>3. Ensure remedial measures properly implemented. | 1. Take immediate action to avoid further exceedance;<br>2. Submit proposals for remedial actions to IEC within three working days of notification;<br>3. Implement the agreed proposals;<br>4. Amend proposal if appropriate. |
| 2. Exceedance for two or more consecutive samples | 1. Notify IEC, WKCDA, Contractor and EPD;<br>2. Identify source;<br>3. Repeat measurement to confirm findings;<br>4. Increase monitoring frequency to daily;<br>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;<br>6. Arrange meeting with IEC and WKCDA to discuss the remedial actions to be taken;<br>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and WKCDA informed of the results;<br>8. If exceedance stops, cease additional monitoring. | 1. Check monitoring data submitted by ET;<br>2. Check Contractor's working method;<br>3. Discuss amongst WKCDA, ET, and Contractor on the potential remedial actions;<br>4. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the WKCDA accordingly;<br>5. Monitor the implementation of remedial measures. | 1. Confirm receipt of notification of failure in writing;<br>2. Notify Contractor;<br>3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented;<br>4. Ensure remedial measures properly implemented;<br>5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated. | 1. Take immediate action to avoid further exceedance;<br>2. Submit proposals for remedial actions to IEC within three working days of notification;<br>3. Implement the agreed proposals;<br>4. Resubmit proposals if problem still not under control;<br>5. Stop the relevant portion of works as determined by the WKCDA until the exceedance is abated. |

**Construction Noise**

In case the Action and Limit Levels are not complied during construction stage, the following Event and Action Plan should be followed:

**Table D-2: Event and Action Plan for Construction Noise**

| Event | Action | | | |
|---|---|---|---|---|
| | ET | IEC | WKCDA | Contractor |
| Action Level | 1. Notify WKCDA, IEC and Contractor;<br>2. Carry out investigation;<br>3. Report the results of investigation to the IEC, WKCDA and Contractor;<br>4. Discuss with the IEC and Contractor on remedial measures required;<br>5. Increase monitoring frequency to check mitigation effectiveness. | 1. Review the investigation results submitted by the ET;<br>2. Review the proposed remedial measures by the Contractor and advise the WKCDA accordingly;<br>3. Advise the WKCDA on the effectiveness of the proposed remedial measures. | 1. Confirm receipt of notification of failure in writing;<br>2. Notify Contractor;<br>3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented;<br>4. Supervise the implementation of remedial measures. | 1. Submit noise mitigation proposals to IEC and WKCDA;<br>2. Implement noise mitigation proposals. |
| Limit Level | 1. Inform IEC, WKCDA, Contractor and EPD;<br>2. Repeat measurements to confirm findings;<br>3. Increase monitoring frequency;<br>4. Identify source and investigate the cause of exceedance;<br>5. Carry out analysis of Contractor's working procedures;<br>6. Discuss with the IEC, Contractor and WKCDA on remedial measures required;<br>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and WKCDA informed of the results;<br>8. If exceedance stops, cease additional monitoring. | 1. Discuss amongst WKCDA, ET, and Contractor on the potential remedial actions;<br>2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the WKCDA accordingly. | 1. Confirm receipt of notification of failure in writing;<br>2. Notify Contractor;<br>3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented;<br>4. Supervise the implementation of remedial measures;<br>5. If exceedance continues, consider stopping the Contractor to continue working on that portion of work which causes the exceedance until the exceedance is abated. | 1. Take immediate action to avoid further exceedance;<br>2. Submit proposals for remedial actions to IEC and WKCDA within 3 working days of notification;<br>3. Implement the agreed proposals;<br>4. Submit further proposal if problem still not under control;<br>5. Stop the relevant portion of works as instructed by the WKCDA until the exceedance is abated. |

**Landscape and Visual Impact**

In case of non-compliance of landscape and visual impacts, procedures in accordance with the Event and Action Plan should be followed:

**Table D-3: Event and Action Plan for Landscape and Visual Impact**

| Event | Action | | | |
|---|---|---|---|---|
| | Action | Event | Action | Event |
| Design Check | 1. Design check to make sure the design complies with all the proposed mitigation measures in the EIA report;<br>2. Prepare and submit report. | 1. Check report submitted by ET;<br>2. Recommend remedial design if necessary. | 1. Undertake remedial design if necessary. | - |
| Non-conformity on one occasion | 1. Identify source of non-conformity;<br>2. Report to IEC and WKCDA;<br>3. Discuss remedial actions with IEC, WKCDA and Contractor;<br>4. Monitor remedial actions until rectification has been completed. | 1. Check and verify source of non-conformity;<br>2. Discuss remedial actions with ET and Contractor;<br>3. Advise WKCDA on effectiveness of proposed remedial actions;<br>4. Check implementation of remedial actions. | 1. Notify Contractor;<br>2. Ensure remedial actions are properly implemented. | 1. Amend working method as necessary;<br>2. Rectify damage and undertake necessary replacement and remedial actions. |
| Repeated non-conformity | 1. Identify source of non-conformity;<br>2. Report to IEC and WKCDA;<br>3. Increase monitoring frequency;<br>4. Discuss remedial actions with IEC, WKCDA and Contractor;<br>5. Monitor remedial actions until rectification has been completed;<br>6. If non-conformity rectified, reduce monitoring frequency back to normal. | 1. Check and verify source of non-conformity;<br>2. Check Contractor's working method;<br>3. Discuss remedial actions with ET and Contractor;<br>4. Advise WKCDA on effectiveness of proposed remedial actions;<br>5. Supervise implementation of remedial actions. | 1. Notify Contractor;<br>2. Ensure remedial actions are properly implemented. | 1. Amend working method as necessary;<br>2. Rectify damage and undertake necessary replacement and remedial actions. |

# E. Monitoring Schedule

Notes:
AM3A - Northeast corner of West Kowloon Station's station box (G/F)
AM4A - Southeast corner of West Kowloon Station's station box (G/F)
AM5A - North of West Kowloon Station's station box (G/F)
NM2A - The Arch – Sun Tower (G/F)
NM3A - Xiqu Centre (G/F)
NM4A - Next to Tsim Sha Tsui Fire Station (G/F)
NM5A - Pedestrian road (G/F) outside West Kowloon Station

# April 2024 (Hong Kong)

May 2024

| S | M | T | W | T | F | S |
|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 26 | 27 | 28 | 29 | 30 | 31 | |

| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|---|---|---|---|---|---|---|
| 31<br>Easter Sunday | 1<br>● Easter Monday | 2 | 3<br>AM3A,AM4A,AM5A -<br>24-hr TSP, 1-hr TSP X 3<br>NM2A,NM3A,NM4A,NM5A -<br>Noise Impact Monitoring | 4<br>● Tomb Sweeping Day | 5 | 6<br>AM3A,AM4A,AM5A -<br>24-hr TSP, 1-hr TSP X 3<br>NM2A,NM3A,NM4A,NM5A -<br>Noise Impact Monitoring |
| 7 | 8 | 9 | 10<br>Landscape & Visual Inspection<br>Zone 2B & 2C | 11 | 12<br>AM3A,AM4A,AM5A -<br>24-hr TSP, 1-hr TSP X 3<br>NM2A,NM3A,NM4A,NM5A -<br>Noise Impact Monitoring | 13 |
| 14 | 15 | 16 | 17 | 18<br>AM3A,AM4A,AM5A -<br>24-hr TSP, 1-hr TSP X 3<br>NM2A,NM3A,NM4A,NM5A -<br>Noise Impact Monitoring | 19 | 20 |
| 21 | 22 | 23 | 24<br>Landscape & Visual Inspection<br>Zone 2B & 2C<br>AM3A,AM4A,AM5A -<br>24-hr TSP, 1-hr TSP X 3<br>NM2A,NM3A,NM4A,NM5A -<br>Noise Impact Monitoring | 25 | 26 | 27 |
| 28 | 29 | 30<br>AM3A,AM4A,AM5A -<br>24-hr TSP, 1-hr TSP X 3<br>NM2A,NM3A,NM4A,NM5A -<br>Noise Impact Monitoring | 1<br>● Labour Day | 2 | 3 | 4 |

● Federal Holidays ● Local Holidays ●● Multiple Events

Notes:
AM3A - Northeast corner of West Kowloon Station's station box (G/F)
AM4A - Southeast corner of West Kowloon Station's station box (G/F)
AM5A - North of West Kowloon Station's station box (G/F)
NM2A - The Arch – Sun Tower (G/F)
NM3A - Xiqu Centre (G/F)
NM4A - Next to Tsim Sha Tsui Fire Station (G/F)
NM5A - Pedestrian road (G/F) outside West Kowloon Station

# May 2024 (Hong Kong)

June 2024

| S | M | T | W | T | F | S |
|---|---|---|---|---|---|---|
| | | | | | | 1 |
| 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| 30 | | | | | | |

| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|---|---|---|---|---|---|---|
| 28 | 29 | 30 | 1<br>● Labour Day | 2 | 3 | 4 |
| 5 | 6<br>AM3A,AM4A,AM5A -<br>24-hr TSP, 1-hr TSP X 3<br>NM2A,NM3A,NM4A,NM5A -<br>Noise Impact Monitoring | 7 | 8<br>Landscape & Visual Inspection<br>Zone 2B & 2C | 9 | 10 | 11<br>AM3A,AM4A,AM5A -<br>24-hr TSP, 1-hr TSP X 3<br>NM2A,NM3A,NM4A,NM5A -<br>Noise Impact Monitoring |
| 12<br>Mother's Day | 13 | 14 | 15<br>● Buddha's Birthday | 16 | 17<br>AM3A,AM4A,AM5A -<br>24-hr TSP, 1-hr TSP X 3<br>NM2A,NM3A,NM4A,NM5A -<br>Noise Impact Monitoring | 18 |
| 19 | 20 | 21 | 22<br>Landscape & Visual Inspection<br>Zone 2B & 2C | 23<br>AM3A,AM4A,AM5A -<br>24-hr TSP, 1-hr TSP X 3<br>NM2A,NM3A,NM4A,NM5A -<br>Noise Impact Monitoring | 24 | 25 |
| 26 | 27 | 28 | 29<br>AM3A,AM4A,AM5A -<br>24-hr TSP, 1-hr TSP X 3<br>NM2A,NM3A,NM4A,NM5A -<br>Noise Impact Monitoring | 30 | 31 | 1 |

● Federal Holidays ● Local Holidays ●● Multiple Events

# F. Calibration Certifications

TISCH Environmental

| RECALIBRATION DUE DATE: |
|---|
| November 7, 2024 |

# Certificate of Calibration

| Calibration Certification Information | | | | | |
|---|---|---|---|---|---|
| **Cal. Date:** | November 7, 2023 | **Rootsmeter S/N:** 438320 | **Ta:** 295 | °K | |
| **Operator:** | Jim Tisch | | **Pa:** 747.5 | mm Hg | |
| **Calibration Model #:** | TE-5025A | **Calibrator S/N:** **4088** | | | |

| Run | Vol. Init (m3) | Vol. Final (m3) | ΔVol. (m3) | ΔTime (min) | ΔP (mm Hg) | ΔH (in H2O) |
|---|---|---|---|---|---|---|
| 1 | 1 | 2 | 1 | 1.4450 | 3.3 | 2.00 |
| 2 | 3 | 4 | 1 | 1.0260 | 6.4 | 4.00 |
| 3 | 5 | 6 | 1 | 0.9150 | 8.1 | 5.00 |
| 4 | 7 | 8 | 1 | 0.8740 | 8.8 | 5.50 |
| 5 | 9 | 10 | 1 | 0.7210 | 12.8 | 8.00 |

**Data Tabulation**

| Vstd (m3) | Qstd (x-axis) | $\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$ (y-axis) | Va | Qa (x-axis) | $\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis) |
|---|---|---|---|---|---|
| 0.9892 | 0.6846 | 1.4097 | 0.9956 | 0.6890 | 0.8884 |
| 0.9851 | 0.9601 | 1.9936 | 0.9914 | 0.9663 | 1.2564 |
| 0.9828 | 1.0741 | 2.2289 | 0.9892 | 1.0811 | 1.4047 |
| 0.9819 | 1.1234 | 2.3377 | 0.9882 | 1.1307 | 1.4733 |
| 0.9766 | 1.3545 | 2.8193 | 0.9829 | 1.3632 | 1.7768 |
| **QSTD** | **m=** | **2.10445** | **QA** | **m=** | **1.31777** |
| | **b=** | **-0.02941** | | **b=** | **-0.01854** |
| | **r=** | **0.99999** | | **r=** | **0.99999** |

**Calculations**

| | | | |
|---|---|---|---|
| **Vstd=** | ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta) | **Va=** | ΔVol((Pa-ΔP)/Pa) |
| **Qstd=** | Vstd/ΔTime | **Qa=** | Va/ΔTime |

**For subsequent flow rate calculations:**

**Qstd=** $1/m\left(\left(\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}\right)-b\right)$

**Qa=** $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

| Standard Conditions | |
|---|---|
| Tstd: | 298.15 °K |
| Pstd: | 760 mm Hg |

| Key |
|---|
| ΔH: calibrator manometer reading (in H2O) |
| ΔP: rootsmeter manometer reading (mm Hg) |
| Ta: actual absolute temperature (°K) |
| Pa: actual barometric pressure (mm Hg) |
| b: intercept |
| m: slope |

**RECALIBRATION**

US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30

Tisch Environmental, Inc.
145 South Miami Avenue
Village of Cleves, OH 45002

www.tisch-env.com
TOLL FREE: (877)263-7610
FAX: (513)467-9009

# TE-5170 Calibration Worksheet

## Site Information

| | | |
|---|---|---|
| **Location:** AM3A | **Site ID:** Zones 2A at West Kowloon Cultural | **Date:** 16-Feb-24 |
| **Sampler:** TE-5170 | **Serial No:** 4340 | **Tech:** CS Tang |

## Site Conditions

| | |
|---|---|
| **Barometric Pressure (in Hg):** 30.11 | **Corrected Pressure (mm Hg):** 765 |
| **Temperature (deg F):** 69 | **Temperature (deg K):** 293 |
| **Average Press. (in Hg):** 30.11 | **Corrected Average (mm Hg):** 765 |
| **Average Temp. (deg F):** 69 | **Average Temp. (deg K):** 293 |

## Calibration Orifice

| | |
|---|---|
| **Make:** Tisch | **Qstd Slope:** 2.10445 |
| **Model:** TE-5025A | **Qstd Intercept:** -0.02941 |
| **Serial#:** 4088 | **Date Certified:** 7-Nov-23 |

## Calibration Information

| Plate or Test # | H2O (in) | Qstd (m3/min) | I (chart) | IC (corrected) |
|---|---|---|---|---|
| 1 | 12.60 | 1.719 | 53.0 | 53.58 |
| 2 | 10.40 | 1.563 | 48.0 | 48.53 |
| 3 | 7.60 | 1.338 | 41.0 | 41.45 |
| 4 | 4.30 | 1.010 | 33.0 | 33.36 |
| 5 | 2.40 | 0.758 | 23.0 | 23.25 |

**Linear Regression**

**Slope:** 30.5589
**Intercept:** 0.9856
**Corr. Coeff:** 0.9971

**# of Observations:** 5

## Calculations

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart response
I = actual chart response
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure

**Average I (chart):** 40
**Average Flow Calculation m3/min**
1.277836059
**Average Flow Calculation in CFM**
45.12039125
**Sample Time (Hrs):** 1.0
**Total Flow in m3/min**
76.67016355
**Total Flow in CFM**
2707.223475

**NOTE: Ensure calibration orifice has been certified within 12 months of use**

# TE-5170 Calibration Worksheet

## Site Information

| | | |
|---|---|---|
| **Location:** AM3A | **Site ID:** Zones 2A at West Kowloon Cultural | **Date:** 13-Apr-24 |
| **Sampler:** TE-5170 | **Serial No:** 4340 | **Tech:** CS Tang |

## Site Conditions

| | | | |
|---|---|---|---|
| **Barometric Pressure (in Hg):** | 29.86 | **Corrected Pressure (mm Hg):** | 758 |
| **Temperature (deg F):** | 80 | **Temperature (deg K):** | 300 |
| **Average Press. (in Hg):** | 29.86 | **Corrected Average (mm Hg):** | 758 |
| **Average Temp. (deg F):** | 80 | **Average Temp. (deg K):** | 300 |

## Calibration Orifice

| | | | |
|---|---|---|---|
| **Make:** | Tisch | **Qstd Slope:** | 2.10445 |
| **Model:** | TE-5025A | **Qstd Intercept:** | -0.02941 |
| **Serial#:** | 4088 | **Date Certified:** | 7-Nov-23 |

## Calibration Information

| Plate or Test # | H2O (in) | Qstd (m3/min) | I (chart) | IC (corrected) |
|---|---|---|---|---|
| 1 | 12.50 | 1.687 | 53.0 | 52.78 |
| 2 | 10.70 | 1.562 | 48.0 | 47.80 |
| 3 | 7.60 | 1.318 | 41.0 | 40.83 |
| 4 | 4.40 | 1.007 | 33.0 | 32.86 |
| 5 | 2.50 | 0.762 | 23.0 | 22.90 |

**Linear Regression**

**Slope:** 30.9168
**Intercept:** 0.2564
**Corr. Coeff:** 0.9967

**# of Observations:** 5

## Calculations

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart response
I = actual chart response
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure

**Average I (chart):** 40
**Average Flow Calculation m3/min**
1.267191112
**Average Flow Calculation in CFM**
44.74451816
**Sample Time (Hrs):** 1.0
**Total Flow in m3/min**
76.03146672
**Total Flow in CFM**
2684.67109

**NOTE: Ensure calibration orifice has been certified within 12 months of use**

# TE-5170 Calibration Worksheet

## Site Information

| | | |
|---|---|---|
| **Location:** AM4A | **Site ID:** Zones 2A at West Kowloon Cultural | **Date:** 16-Feb-24 |
| **Sampler:** TE-5170 | **Serial No:** 3998 | **Tech:** CS Tang |

## Site Conditions

| | |
|---|---|
| **Barometric Pressure (in Hg):** 30.11 | **Corrected Pressure (mm Hg):** 765 |
| **Temperature (deg F):** 69 | **Temperature (deg K):** 293 |
| **Average Press. (in Hg):** 30.11 | **Corrected Average (mm Hg):** 765 |
| **Average Temp. (deg F):** 69 | **Average Temp. (deg K):** 293 |

## Calibration Orifice

| | |
|---|---|
| **Make:** Tisch | **Qstd Slope:** 2.10445 |
| **Model:** TE-5025A | **Qstd Intercept:** -0.02941 |
| **Serial#:** 4088 | **Date Certified:** 7-Nov-23 |

## Calibration Information

| Plate or Test # | H2O (in) | Qstd (m3/min) | I (chart) | IC (corrected) |
|---|---|---|---|---|
| 1 | 12.70 | 1.726 | 53.0 | 53.58 |
| 2 | 10.80 | 1.593 | 48.0 | 48.53 |
| 3 | 7.50 | 1.330 | 41.0 | 41.45 |
| 4 | 4.70 | 1.055 | 33.0 | 33.36 |
| 5 | 2.60 | 0.789 | 23.0 | 23.25 |

**Linear Regression**

**Slope:** 31.4123
**Intercept:** -0.7533
**Corr. Coeff:** 0.9980

**# of Observations:** 5

## Calculations

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart response
I = actual chart response
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure

**Average I (chart):** 40
**Average Flow Calculation m3/min**
1.298479492
**Average Flow Calculation in CFM**
45.84931085
**Sample Time (Hrs):** 1.0
**Total Flow in m3/min**
77.9087695
**Total Flow in CFM**
2750.958651

**NOTE: Ensure calibration orifice has been certified within 12 months of use**

# TE-5170 Calibration Worksheet

## Site Information

| | | |
|---|---|---|
| **Location:** AM4A | **Site ID:** Zones 2A at West Kowloon Cultural | **Date:** 13-Apr-24 |
| **Sampler:** TE-5170 | **Serial No:** 3998 | **Tech:** CS Tang |

## Site Conditions

| | | | |
|---|---|---|---|
| **Barometric Pressure (in Hg):** | 29.86 | **Corrected Pressure (mm Hg):** | 758 |
| **Temperature (deg F):** | 80 | **Temperature (deg K):** | 300 |
| **Average Press. (in Hg):** | 29.86 | **Corrected Average (mm Hg):** | 758 |
| **Average Temp. (deg F):** | 80 | **Average Temp. (deg K):** | 300 |

## Calibration Orifice

| | | | |
|---|---|---|---|
| **Make:** | Tisch | **Qstd Slope:** | 2.10445 |
| **Model:** | TE-5025A | **Qstd Intercept:** | -0.02941 |
| **Serial#:** | 4088 | **Date Certified:** | 7-Nov-23 |

## Calibration Information

| Plate or Test # | H2O (in) | Qstd (m3/min) | I (chart) | IC (corrected) |
|---|---|---|---|---|
| 1 | 12.60 | 1.694 | 53.0 | 52.78 |
| 2 | 10.60 | 1.555 | 48.0 | 47.80 |
| 3 | 7.70 | 1.327 | 41.0 | 40.83 |
| 4 | 4.50 | 1.018 | 33.0 | 32.86 |
| 5 | 2.50 | 0.762 | 23.0 | 22.90 |

**Linear Regression**

**Slope:** 31.0401
**Intercept:** -0.0190
**Corr. Coeff:** 0.9977

**# of Observations:** 5

## Calculations

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart response
I = actual chart response
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure

**Average I (chart):** 40
**Average Flow Calculation m3/min**
1.271030858
**Average Flow Calculation in CFM**
44.88009959
**Sample Time (Hrs):** 1.0
**Total Flow in m3/min**
76.26185148
**Total Flow in CFM**
2692.805976

**NOTE: Ensure calibration orifice has been certified within 12 months of use**

# TE-5170 Calibration Worksheet

## Site Information

| | | |
|---|---|---|
| **Location:** AM5A | **Site ID:** Zones 2A at West Kowloon Cultural | **Date:** 16-Feb-24 |
| **Sampler:** TE-5170 | **Serial No:** 4344 | **Tech:** CS Tang |

## Site Conditions

| | |
|---|---|
| **Barometric Pressure (in Hg):** 30.11 | **Corrected Pressure (mm Hg):** 765 |
| **Temperature (deg F):** 69 | **Temperature (deg K):** 293 |
| **Average Press. (in Hg):** 30.11 | **Corrected Average (mm Hg):** 765 |
| **Average Temp. (deg F):** 69 | **Average Temp. (deg K):** 293 |

## Calibration Orifice

| | |
|---|---|
| **Make:** Tisch | **Qstd Slope:** 2.10445 |
| **Model:** TE-5025A | **Qstd Intercept:** -0.02941 |
| **Serial#:** 4088 | **Date Certified:** 7-Nov-23 |

## Calibration Information

| Plate or Test # | H2O (in) | Qstd (m3/min) | I (chart) | IC (corrected) |
|---|---|---|---|---|
| 1 | 12.70 | 1.726 | 53.0 | 53.58 |
| 2 | 10.50 | 1.571 | 48.0 | 48.53 |
| 3 | 7.50 | 1.330 | 41.0 | 41.45 |
| 4 | 4.60 | 1.044 | 33.0 | 33.36 |
| 5 | 2.70 | 0.803 | 23.0 | 23.25 |

**Linear Regression**

**Slope:** 31.9869
**Intercept:** -1.3813
**Corr. Coeff:** 0.9973

**# of Observations:** 5

## Calculations

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart response
I = actual chart response
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure

**Average I (chart):** 40
**Average Flow Calculation m3/min**
1.29478653
**Average Flow Calculation in CFM**
45.71891237
**Sample Time (Hrs):** 1.0
**Total Flow in m3/min**
77.68719179
**Total Flow in CFM**
2743.134742

**NOTE: Ensure calibration orifice has been certified within 12 months of use**

# TE-5170 Calibration Worksheet

## Site Information

| | | |
|---|---|---|
| **Location:** AM5A | **Site ID:** Zones 2A at West Kowloon Cultural | **Date:** 13-Apr-24 |
| **Sampler:** TE-5170 | **Serial No:** 4344 | **Tech:** CS Tang |

## Site Conditions

| | | | |
|---|---|---|---|
| **Barometric Pressure (in Hg):** | 29.86 | **Corrected Pressure (mm Hg):** | 758 |
| **Temperature (deg F):** | 80 | **Temperature (deg K):** | 300 |
| **Average Press. (in Hg):** | 29.86 | **Corrected Average (mm Hg):** | 758 |
| **Average Temp. (deg F):** | 80 | **Average Temp. (deg K):** | 300 |

## Calibration Orifice

| | | | |
|---|---|---|---|
| **Make:** | Tisch | **Qstd Slope:** | 2.10445 |
| **Model:** | TE-5025A | **Qstd Intercept:** | -0.02941 |
| **Serial#:** | 4088 | **Date Certified:** | 7-Nov-23 |

## Calibration Information

| Plate or Test # | H2O (in) | Qstd (m3/min) | I (chart) | IC (corrected) |
|---|---|---|---|---|
| 1 | 12.80 | 1.707 | 53.0 | 52.78 |
| 2 | 10.70 | 1.562 | 48.0 | 47.80 |
| 3 | 7.60 | 1.318 | 41.0 | 40.83 |
| 4 | 4.70 | 1.040 | 33.0 | 32.86 |
| 5 | 2.80 | 0.806 | 23.0 | 22.90 |

**Linear Regression**

**Slope:** 32.1261
**Intercept:** -1.8982
**Corr. Coeff:** 0.9970

**# of Observations:** 5

## Calculations

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart response
I = actual chart response
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure

**Average I (chart):** 40
**Average Flow Calculation m3/min**
1.286562285
**Average Flow Calculation in CFM**
45.42851429
**Sample Time (Hrs):** 1.0
**Total Flow in m3/min**
77.1937371
**Total Flow in CFM**
2725.710857

**NOTE: Ensure calibration orifice has been certified within 12 months of use**

# CERTIFICATE OF ACCREDITATION

*This is to attest that*

## AQUALITY TESTCONSULT LIMITED

11A&B, KAI FONG GARDEN, PING CHE ROAD
FANLING, HONG KONG

**Calibration Laboratory CL-207**

has met the requirements of AC204, *IAS Accreditation Criteria for Calibration Laboratories*, and has demonstrated compliance with ISO/IEC Standard 17025:2017, *General requirements for the competence of testing and calibration laboratories.* This organization is accredited to provide the services specified in the scope of accreditation.

Effective Date December 17, 2021

Expiration Date December 1, 2023

***President***

Visit www.iasonline.org for current accreditation information.

| MEASURED QUANTITY or DEVICE TYPE CALIBRATED | RANGE | UNCERTAINTY[1,2] (±) | CALIBRATION PROCEDURE AND/OR STANDARD EQUIPMENT USED |
|---|---|---|---|
| Laser Dust Meter[3] | Dust particles<br>0.001 mg/m$^3$ to 10.00 mg/m$^3$ | 0.9 mg/m$^3$ | By comparison method by using reference laser dust meter |
| Rebound Hammer[3] | 80 unit (hardness) | 1.6 rebound count | Reference Rebound count by comparison method.<br>BS1881: Part 202:1986;<br>BS EN 12504-2:2001;<br>BS EN 12504-2:2012 |
| Mass<br>(F2 class and coarser) | 0 g to 200 g<br>200 g to 5 kg<br>5 kg to 10 kg<br>10 kg to 50 kg | 1.3 mg<br>0.5 g<br>0.88 g<br>3 g | Standard Weight E2/ F1 Class & Weighing Balances by comparison method (OIML-R-111) |
| Weighing Scale & Balance[3] | 0 g to 200 g<br>0 kg to 5 kg<br>0 kg to 50 kg | 0.8 mg<br>0.13 g<br>7.7 g | Standard weight of E2/F1 Grade by direct measurement (OIML-R-111) |
| Volumetric Glassware | 1 mL to 100 mL<br>100 mL to 1000 mL | 0.004 mL<br>0.09 mL | Standard weight E2 Class, Weighing Balances & Distilled water by gravimetric method |
| ***Thermal*** | | | |
| Digital/Liquid in Glass Thermometers & RTD/ Thermocouples with or without Indicators | 15 °C to 55 °C<br>55 °C to 95 °C | 0.4 °C<br>0.9 °C | Water Baths, Reference Sensor and Indictor by Comparison Method (OIML R133) |
| Curing Tank[3] | (Calibration at 20 °C & 27 °C @ 30 min)<br><br>20 °C Temperature distribution<br><br>27 °C Temperature distribution<br><br>Efficiency of circulation | <br><br>0.4 °C<br><br>0.8 °C<br><br>5 s | Reference Temperature datalogger by Mapping Method & Reference Stop Watch (Verification in accordance with in-house method for the Temp & Time requirements as specified in BS1881-111:1983<br>CS1:1990 Vol 1 App A24<br>CS1:2010 Vol 1 App A28<br>BE EN 12390-2:2000 |
| Oven[3] | 40.0 °C to 180.0 °C | 1.5 °C | Reference Temperature datalogger by Mapping Method (AS 2853:1986) |
| Furnace[3] | 200 °C to 1300 °C | 6 °C | Reference Thermocouple with Indicator By single point Calibration<br>(AS 2853:1986) |
| Water bath[3] | 15 °C to 95 °C | 0.2 °C | Reference Temperature datalogger by Mapping Method (AS 2853:1986) |

# FAQ / Information

## Mutual Recognition Arrangements (MRA) / Multilateral Recognition Arrangements (MLA)

### Mutual Recognition Arrangement (MRA) Partners for HOKLAS

Every effort is made to promote acceptance of test data from accredited laboratories, both internationally and locally. HKAS has concluded mutual recognition arrangements with accreditation bodies listed below by being one of the signatories of the International Laboratory Accreditation Cooperation Mutual Recognition Arrangement (ILAC MRA) and the Asia Pacific Accreditation Cooperation Mutual Recognition Arrangement (APAC MRA) for testing, calibration, medical testing, Proficiency Testing Providers (PTP) and Reference Material Producers (RMP). Click here to view the up-to-date signatories of ILAC and here to access the up-to-date signatories of APAC.

Visitors checking the names, logos and accreditation symbols shown on an endorsed certificate or report should note that some of our MRA partners may have their names, logos or accreditation symbols changed recently and test reports or certificates endorsed by displaying their old accreditation symbols may still be valid during the change-over period. For details, please visit their websites or contact them directly.

» Mutual Recognition Arrangement (MRA) Partners for HOKLAS

HKAS MRA partners will recognise HOKLAS endorsed test certificates as having the same technical validity as certificates endorsed by their respective schemes.

### Multilateral Recognition Arrangements (MLA) for HKCAS

### Mutual Recognition Arrangement (MRA) Partners for HKIAS

back

Hong Kong Laboratory Accreditation Scheme (HOKLAS) - Mutual Recognition Arrangement (MRA) Partners

| Economy | Logo | Name of Partner | URL | Test Area |
|---|---|---|---|---|
| United States of America | | AIHA Laboratory Accreditation Programs, LLC (AIHA-LAP, LLC) | http://www.aihaaccreditedlabs.org/ | Non-medical Testing |
| United States of America | | American Association for Laboratory Accreditation (A2LA) | http://www.a2la.org | Calibration, Medical Testing, Non-medical Testing, Proficiency Testing Provider, Reference Material Producer |
| United States of America | | ANSI National Accreditation Board (ANAB) | http://www.anab.org/ | Calibration, Medical Testing, Non-medical Testing, Proficiency Testing Provider, Reference Material Producer |
| United States of America | | International Accreditation Service Inc. (IAS) | http://www.iasonline.org/ | Calibration, Medical Testing, Non-medical Testing |
| United States of America | | National Voluntary Laboratory Accreditation Program (NVLAP) | http://www.nist.gov/nvlap | Calibration, Non-medical Testing |

AQuality
東恒測試顧問有限公司
AQUALITY TESTCONSULT LIMITED
香港新界粉嶺坪輋路啟芳園11A&11B號
No. 11A&11B, KAI FONG GARDEN, PING CHE ROAD, FANLING, N.T., HONG KONG
TEL : 852-3582-9589
FAX : 852-2674-1177
EMAIL : cal.aqtl@gmail.com
WEBSITE: www.aqtlgroup.com

# CERTIFICATE OF CALIBRATION

Report Number : 230827MCA-166F
Date of Report : 29-Aug-23

Customer * : Apex Testing & Certification Ltd.
Customer Address* : Unit D6A, 10/F, TML Tower, 3 Hoi Shing Road, Tsuen Wan, N.T., HK
Customers Ref. * : A005

Item Under Calibration (IUC)*
Equipment No. : N/A
Manufacturer : Sibata Scientific Technology Ltd
Model No. : LD-3B
Serial No. : 235811
Scale Division : 0.001 mg/m3
Range : 0.001 to 1 mg/m3
Condition of Item : Normal

Date Item Received : 27-Aug-23
Date Calibrated : 27-Aug-23
Calibration Location : AQuality Calibration Lab.
Date of Next Calibration : 26-Aug-24
Calibrated By : Jessica Liu

Test Environment
Ambient Temperature : 29.2 °C to 30.4 °C
Relative Humidity : 83 % to 88 %

## Calibration Results

| Reference True Reading (mg/m3) | Average IUC Reading ($mg/m^3$) | Correction ($mg/m^3$) | Error of IUC Reading (%) | Expanded Uncertainty ($mg/m^3$) | Coverage Factor K |
|---|---|---|---|---|---|
| 0.158 | 0.167 | -0.008 | 5.1% | 0.020 | 2.0 |
| 5.164 | 5.647 | -0.484 | 8.5% | 0.463 | 2.0 |
| 10.100 | 11.141 | -1.041 | 9.3% | 0.904 | 2.0 |

Remarks :
1. * Denotes information supplied by customer.
2. The results relate only to the items calibrated.
3. The results apply to the items as received.
4. Correction = Average of (Ref reading - IUC reading)
5. The technical requirement of laser dust meter. +/- 20% error for the particles concentration.

Approved by: _____
LEE Mei Yee, Julia
Managing Director

東恒測試顧問有限公司
AQUALITY TESTCONSULT LIMITED
香港新界粉嶺坪輋路啟芳園11A&11B號
No. 11A&11B, KAI FONG GARDEN, PING CHE ROAD, FANLING, N.T., HONG KONG
TEL : 852-3582-9589
FAX : 852-2674-1177
EMAIL : cal.aqtl@gmail.com
WEBSITE: www.aqtlgroup.com

# CERTIFICATE OF CALIBRATION

Report Number : 230827MCA-166F
Date of Report : 29-Aug-23

Customer * : Apex Testing & Certification Ltd.
Customers Ref. * : A005

**Details of Calibration**

1. The calibration was performed in accordance with AQuality Testconsult Procedure Number ENV-L-003 (in-house method), by comparison with the laboratory's reference equipment which have traceable international standards of measurement.

2. The item under calibration (IUC) was allowed to stabilize in the laboratory for 0.25 hour before commencement of calibration.

3. A set of readings were made at each calibration concentration. The values quoted in the results are the average of each set of readings.

4. The values given in this calibration certificate only relate to the values measured at the time of calibration. Any uncertainties quoted do not include allowance for the capabiliy of any other laboratory to repeat the measurement. The uncertainty quoted relate only to item at time of calibration. AQuality Testconsult Limited is not liable for any loss or damage resulting from the use of this equipment.

5. The identification, calibration certificate numbers for the reference equipment used were as follows :

| Equipment Number | Certificate Number | Description |
|---|---|---|
| CH-LDM-1 | HBW202201864 | 粉尘测试仪 |

6. Copies of the Calibration certificates of the reference equipment used in this calibration may be obtained from AQuality Testconsult Limited, if necessary.

- End of Report -

東恒測試顧問有限公司
AQUALITY TESTCONSULT LIMITED
香港新界粉嶺坪輋路啟芳園11A&11B號
No. 11A&11B, KAI FONG GARDEN, PING CHE ROAD, FANLING, N.T., HONG KONG
TEL : 852-3582-9589
FAX : 852-2674-1177
EMAIL : cal.aqtl@gmail.com
WEBSITE: www.aqtlgroup.com

# CERTIFICATE OF CALIBRATION

| | | |
|---|---|---|
| Apex Testing & Certification Ltd.<br>Unit D6A, 10/F, TML Tower, 3 Hoi Shing Road, Tsuen Wan, N.T., HK | Test Report No. | 230827MCA-166F |
| | Date of Issue | 29-Aug-23 |
| | Date of Testing | 27-Aug-23 |
| | Page | 1 of 1 |

**Item for Calibration**

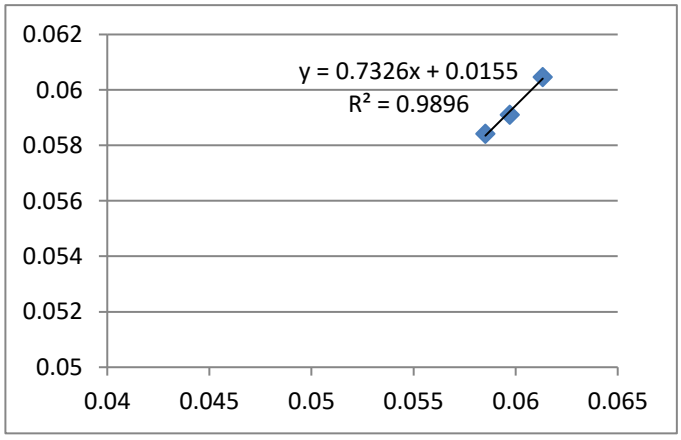
Description : Laser Dust Monitor
Manufacturer : Sibata Scientific Technology Ltd
Model No. : LD-3B
Serial No. : 235811

**Standard Equipment**

Description : High Volume Sampler / Calibration Orifice
Manufacturer : Tisch Environmental, Inc.
Model No. : TE-5170 / TE-5025A
Serial No. 3476 / 4088
Last Calibration : 25-AUG-23 / 28-OCT-22

| Date | Time | Mean Temp (°C) | Mean Pressure (hPa) | Concentration Standard Equipment (mg/m3) | Concentration Calibrated Equipment (mg/m3) |
|---|---|---|---|---|---|
| 27-Aug-23 | 19:00 | 29.8 | 1003.2 | 0.0613 | 0.0605 |
| 27-Aug-23 | 20:05 | 29.8 | 1003.2 | 0.0585 | 0.0584 |
| 27-Aug-23 | 21:10 | 29.8 | 1003.2 | 0.0597 | 0.0591 |

By Linear Regression of Y or X
Slope (K-factor) : 0.7326
Correlation Coefficient : 0.9896
Validity of Calibration : 26-Aug-24




Recorded by : Jessica Liu Signature: Jessica Date: 27-Aug-23

Checked by : S Tang Signature: Tang Date: 27-Aug-23

AQuality
東恒測試顧問有限公司
AQUALITY TESTCONSULT LIMITED
香港新界粉嶺坪輋路啟芳園11A&11B號
No. 11A&11B, KAI FONG GARDEN, PING CHE ROAD, FANLING, N.T., HONG KONG
TEL : 852-3582-9589
FAX : 852-2674-1177
EMAIL : cal.aqtl@gmail.com
WEBSITE: www.aqtlgroup.com

# CERTIFICATE OF CALIBRATION

Report Number : 230827MCA-163F
Date of Report : 29-Aug-23

Customer * : Apex Testing & Certification Ltd.
Customer Address* : Unit D6A, 10/F, TML Tower, 3 Hoi Shing Road, Tsuen Wan, N.T., HK
Customers Ref. * : A005

Item Under Calibration (IUC)*
Equipment No. : N/A
Manufacturer : Sibata Scientific Technology Ltd
Model No. : LD-3B
Serial No. : 336338
Scale Division : 0.001 mg/m3
Range : 0.001 to 1 mg/m3
Condition of Item : Normal

Date Item Received : 27-Aug-23
Date Calibrated : 27-Aug-23
Calibration Location : AQuality Calibration Lab.
Date of Next Calibration : 26-Aug-24
Calibrated By : Jessica Liu

Test Environment
Ambient Temperature : 29.2 °C to 30.4 °C
Relative Humidity : 83 % to 88 %

## Calibration Results

| Reference True Reading (mg/m3) | Average IUC Reading ($mg/m^3$) | Correction ($mg/m^3$) | Error of IUC Reading (%) | Expanded Uncertainty ($mg/m^3$) | Coverage Factor K |
|---|---|---|---|---|---|
| 0.158 | 0.168 | -0.010 | 5.7% | 0.026 | 2.0 |
| 5.164 | 5.562 | -0.398 | 7.1% | 0.462 | 2.0 |
| 10.100 | 10.936 | -0.837 | 7.6% | 0.905 | 2.0 |

Remarks :
1. * Denotes information supplied by customer.
2. The results relate only to the items calibrated.
3. The results apply to the items as received.
4. Correction = Average of (Ref reading - IUC reading)
5. The technical requirement of laser dust meter. +/- 20% error for the particles concentration.

Approved by: _____
LEE Mei Yee, Julia
Managing Director

東恒測試顧問有限公司
AQUALITY TESTCONSULT LIMITED
香港新界粉嶺坪輋路啟芳園11A&11B號
No. 11A&11B, KAI FONG GARDEN, PING CHE ROAD, FANLING, N.T., HONG KONG
TEL : 852-3582-9589
FAX : 852-2674-1177
EMAIL : cal.aqtl@gmail.com
WEBSITE: www.aqtlgroup.com

# CERTIFICATE OF CALIBRATION

Report Number : 230827MCA-163F
Date of Report : 29-Aug-23

Customer * : Apex Testing & Certification Ltd.
Customers Ref. * : A005

**Details of Calibration**

1. The calibration was performed in accordance with AQuality Testconsult Procedure Number ENV-L-003 (in-house method), by comparison with the laboratory's reference equipment which have traceable international standards of measurement.

2. The item under calibration (IUC) was allowed to stabilize in the laboratory for 0.25 hour before commencement of calibration.

3. A set of readings were made at each calibration concentration. The values quoted in the results are the average of each set of readings.

4. The values given in this calibration certificate only relate to the values measured at the time of calibration. Any uncertainties quoted do not include allowance for the capabiliy of any other laboratory to repeat the measurement. The uncertainty quoted relate only to item at time of calibration. AQuality Testconsult Limited is not liable for any loss or damage resulting from the use of this equipment.

5. The identification, calibration certificate numbers for the reference equipment used were as follows :

| Equipment Number | Certificate Number | Description |
|---|---|---|
| CH-LDM-1 | HBW202201864 | 粉尘测试仪 |

6. Copies of the Calibration certificates of the reference equipment used in this calibration may be obtained from AQuality Testconsult Limited, if necessary.

- End of Report -

東恒測試顧問有限公司
AQUALITY TESTCONSULT LIMITED
香港新界粉嶺坪輋路啟芳園11A&11B號
No. 11A&11B, KAI FONG GARDEN, PING CHE ROAD, FANLING, N.T., HONG KONG
TEL : 852-3582-9589
FAX : 852-2674-1177
EMAIL : cal.aqtl@gmail.com
WEBSITE: www.aqtlgroup.com

# CERTIFICATE OF CALIBRATION

| | | |
|---|---|---|
| Apex Testing & Certification Ltd.<br>Unit D6A, 10/F, TML Tower, 3 Hoi Shing Road, Tsuen Wan, N.T., HK | Test Report No. | 230827MCA-163F |
| | Date of Issue | 29-Aug-23 |
| | Date of Testing | 27-Aug-23 |
| | Page | 1 of 1 |

**Item for Calibration**

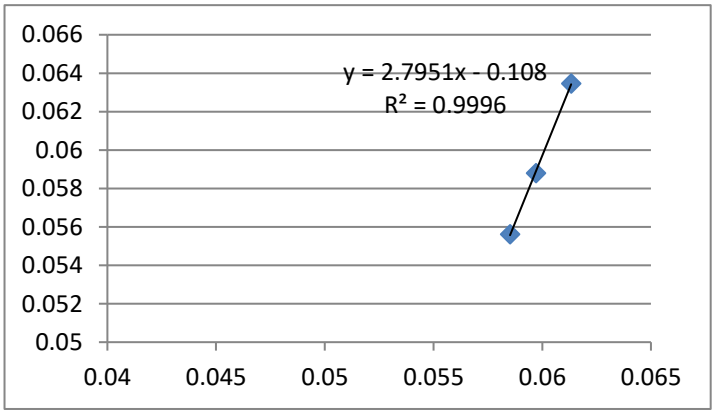
Description : Laser Dust Monitor
Manufacturer : Sibata Scientific Technology Ltd
Model No. : LD-3B
Serial No. : 336338

**Standard Equipment**

Description : High Volume Sampler / Calibration Orifice
Manufacturer : Tisch Environmental, Inc.
Model No. : TE-5170 / TE-5025A
Serial No. 3476 / 4088
Last Calibration : 25-AUG-23 / 28-OCT-22

| Date | Time | Mean Temp (°C) | Mean Pressure (hPa) | Concentration Standard Equipment (mg/m3) | Concentration Calibrated Equipment (mg/m3) |
|---|---|---|---|---|---|
| 27-Aug-23 | 19:00 | 29.8 | 1003.2 | 0.0613 | 0.0635 |
| 27-Aug-23 | 20:05 | 29.8 | 1003.2 | 0.0585 | 0.0556 |
| 27-Aug-23 | 21:10 | 29.8 | 1003.2 | 0.0597 | 0.0588 |

By Linear Regression of Y or X
Slope (K-factor) : 2.7951
Correlation Coefficient : 0.9996
Validity of Calibration : 26-Aug-24




Recorded by : Jessica Liu Signature: Jessica Date: 27-Aug-23

Checked by : S Tang Signature: S Tang Date: 27-Aug-23

AQuality
東恒測試顧問有限公司
AQUALITY TESTCONSULT LIMITED
香港新界粉嶺坪輋路啟芳園11A&11B號
No. 11A&11B, KAI FONG GARDEN, PING CHE ROAD, FANLING, N.T., HONG KONG
TEL : 852-3582-9589
FAX : 852-2674-1177
EMAIL : cal.aqtl@gmail.com
WEBSITE: www.aqtlgroup.com

# CERTIFICATE OF CALIBRATION

Report Number : 230827MCA-165F
Date of Report : 29-Aug-23

Customer * : Apex Testing & Certification Ltd.
Customer Address* : Unit D6A, 10/F, TML Tower, 3 Hoi Shing Road, Tsuen Wan, N.T., HK
Customers Ref. * : A005

Item Under Calibration (IUC)*
Equipment No. : N/A
Manufacturer : Sibata Scientific Technology Ltd
Model No. : LD-3B
Serial No. : 567188
Scale Division : 0.001 mg/m3
Range : 0.001 to 1 mg/m3
Condition of Item : Normal

Date Item Received : 27-Aug-23
Date Calibrated : 27-Aug-23
Calibration Location : AQuality Calibration Lab.
Date of Next Calibration : 26-Aug-24
Calibrated By : Jessica Liu

Test Environment
Ambient Temperature : 29.2 °C to 30.4 °C
Relative Humidity : 83 % to 88 %

## Calibration Results

| Reference True Reading (mg/m3) | Average IUC Reading ($mg/m^3$) | Correction ($mg/m^3$) | Error of IUC Reading (%) | Expanded Uncertainty ($mg/m^3$) | Coverage Factor K |
|---|---|---|---|---|---|
| 0.158 | 0.167 | -0.008 | 4.9% | 0.023 | 2.0 |
| 5.164 | 5.693 | -0.530 | 9.3% | 0.463 | 2.0 |
| 10.100 | 11.045 | -0.945 | 8.6% | 0.905 | 2.0 |

Remarks :
1. * Denotes information supplied by customer.
2. The results relate only to the items calibrated.
3. The results apply to the items as received.
4. Correction = Average of (Ref reading - IUC reading)
5. The technical requirement of laser dust meter. +/- 20% error for the particles concentration.

Approved by: _____
LEE Mei Yee, Julia
Managing Director

東恒測試顧問有限公司
AQUALITY TESTCONSULT LIMITED
香港新界粉嶺坪輋路啟芳園11A&11B號
No. 11A&11B, KAI FONG GARDEN, PING CHE ROAD, FANLING, N.T., HONG KONG
TEL : 852-3582-9589
FAX : 852-2674-1177
EMAIL : cal.aqtl@gmail.com
WEBSITE: www.aqtlgroup.com

# CERTIFICATE OF CALIBRATION

Report Number : 230827MCA-165F
Date of Report : 29-Aug-23

Customer * : Apex Testing & Certification Ltd.
Customers Ref. * : A005

**Details of Calibration**

1. The calibration was performed in accordance with AQuality Testconsult Procedure Number ENV-L-003 (in-house method), by comparison with the laboratory's reference equipment which have traceable international standards of measurement.

2. The item under calibration (IUC) was allowed to stabilize in the laboratory for 0.25 hour before commencement of calibration.

3. A set of readings were made at each calibration concentration. The values quoted in the results are the average of each set of readings.

4. The values given in this calibration certificate only relate to the values measured at the time of calibration. Any uncertainties quoted do not include allowance for the capabiliy of any other laboratory to repeat the measurement. The uncertainty quoted relate only to item at time of calibration. AQuality Testconsult Limited is not liable for any loss or damage resulting from the use of this equipment.

5. The identification, calibration certificate numbers for the reference equipment used were as follows :

| Equipment Number | Certificate Number | Description |
|---|---|---|
| CH-LDM-1 | HBW202201864 | 粉尘测试仪 |

6. Copies of the Calibration certificates of the reference equipment used in this calibration may be obtained from AQuality Testconsult Limited, if necessary.

- End of Report -

東恒測試顧問有限公司
AQUALITY TESTCONSULT LIMITED
香港新界粉嶺坪輋路啟芳園11A&11B號
No. 11A&11B, KAI FONG GARDEN, PING CHE ROAD, FANLING, N.T., HONG KONG
TEL : 852-3582-9589
FAX : 852-2674-1177
EMAIL : cal.aqtl@gmail.com
WEBSITE: www.aqtlgroup.com

# CERTIFICATE OF CALIBRATION

| | | |
|---|---|---|
| Apex Testing & Certification Ltd.<br>Unit D6A, 10/F, TML Tower, 3 Hoi Shing Road, Tsuen Wan, N.T., HK | Test Report No. | 230827MCA-165F |
| | Date of Issue | 29-Aug-23 |
| | Date of Testing | 27-Aug-23 |
| | Page | 1 of 1 |

**Item for Calibration**

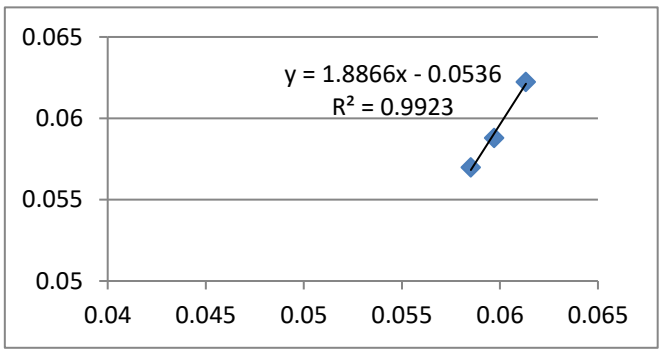
Description : Laser Dust Monitor
Manufacturer : Sibata Scientific Technology Ltd
Model No. : LD-3B
Serial No. : 567188

**Standard Equipment**

Description : High Volume Sampler / Calibration Orifice
Manufacturer : Tisch Environmental, Inc.
Model No. : TE-5170 / TE-5025A
Serial No. 3476 / 4088
Last Calibration : 25-AUG-23 / 28-OCT-22

| Date | Time | Mean Temp (°C) | Mean Pressure (hPa) | Concentration Standard Equipment (mg/m3) | Concentration Calibrated Equipment (mg/m3) |
|---|---|---|---|---|---|
| 27-Aug-23 | 19:00 | 29.8 | 1003.2 | 0.0613 | 0.0622 |
| 27-Aug-23 | 20:05 | 29.8 | 1003.2 | 0.0585 | 0.0570 |
| 27-Aug-23 | 21:10 | 29.8 | 1003.2 | 0.0597 | 0.0588 |

By Linear Regression of Y or X
Slope (K-factor) : 1.8866
Correlation Coefficient : 0.9923
Validity of Calibration : 26-Aug-24




Recorded by : Jessica Liu Signature: Jessica Date: 27-Aug-23

Checked by : S Tang Signature: S Tang Date: 27-Aug-23

CTI 华测检测

中国认可
国际互认
校准
CALIBRATION
CNAS L5102

# 华测计量检测有限公司

## CTI MEASUREMENT AND TESTING CO., LTD.

# 校准证书

## Calibration Certificate

| | | | |
|---|---|---|---|
| 证书编号<br>Certificate No. | C2310110830002 | 第 1 页 共 7 页<br>Page of | |
| 委托单位<br>Customer | 上峰检测认证有限公司 | | |
| 委托单位地址<br>Address | 香港荃湾海盛路3号TML广场10楼D6A室 | | |
| 器具名称<br>Name of instrument | 声级计 | | |
| 型号规格<br>Model | AWA5661 | | |
| 制造商<br>Manufacturer | 杭州爱华仪器有限公司 | | |
| 出厂编号<br>Serial No. | 301135 | 管理编号<br>Management No. | -------- |
| 接收日期<br>Received date | 2023/10/11 | 校准日期<br>Calibration date | 2023/10/16 |
| 发布日期<br>Issue date | 2023/10/20 | 建议下次校准日期<br>Next calibration date | 2024/10/15 |

证书/报告章
Stamp

| | |
|---|---|
| 批准<br>Approved by | 许彦 |
| 审核<br>Inspected by | 刘然 |
| 校准<br>Calibrated by | 李少雄 |


总部地址：广东省深圳市宝安区西乡街道铁岗社区桃花源科技创新园B、C栋
Building B,C, Taohuayuan Sci-Tech Innovation Park, Tiegang Community, Xixiang Sub-district, Bao'an District, Shenzhen, Guangdong, China
实验室地址：广东省深圳市宝安区西乡街道铁岗社区桃花源科技创新园B、C栋
Laboratory address :Building B and C, Taohuayuan Sci-Tech Innovation Park, Tiegang Community, Xixiang Sub-district, Bao'an District, Shenzhen, Guangdong, China
邮编：518101 Post code　电话：86-755-33682045 Tel.　传真：86-755-33683385 Fax　电子邮箱：calibration@cti-cert.com E-mail

# 说 明

## Directions



1. **本证书校准结果均可溯源至国际单位制（SI）单位。**
The results are traceable to International System of Units(SI).

2. **证书未盖本公司证书/报告章及骑缝章无效。未经本公司书面批准，不得部分复制此证书。**
Any certificate is deemed to be invalid without both the certificate/report seal and its across-page seal. This certificate shall not be copied partly without the written approval.

3. **本证书校准结果只与受校准仪器有关。如证书中的英文内容与中文内容有差异，以中文为准。**
The results relate only to the items calibrated.In case of any discrepancy between the English version and Chinese version of the certificate(if generated), the Chinese version shall prevail.

4. **本次校准的技术依据：**
Reference documents for the calibration
JJG 188-2017 声级计检定规程

5. **本次校准所使用的主要计量标准器具：**
Main mearsurement standards used in the calibration

| 名称/型号规格 Name/Model | 编号 Serial No. | 测量范围 Measurement range | 计量特性 Technical characteristic | 证书号/溯源机构 Certificate No./Traceability to | 有效期 Due date |
|---|---|---|---|---|---|
| 测量放大器 AWA5810D | 089909 | 4Hz~20kHz | 灵敏度：$U$=0.04dB,$k$=2<br>频率计权：$U$=0.2dB,$k$=2<br>线性计权：<br>4Hz～10Hz:$U$=0.11dB,$k$=2<br>10Hz～<br>20kHz:$U$=0.04dB,$k$=2 | SXE202380707<br>广东省计量科学研究院 | 2024/07/25 |
| 声校准器 4231 | 3014336 | 94dB~114dB | 1级 | SXE202330553<br>广东省计量科学研究院 | 2024/07/30 |
| 消声箱 AWA188 | 080312 | 10Hz~20kHz<br>（20~130）dB | $U$=0.8dB,$k$=2 | JL2383018051<br>深圳市计量质量检测研究院 | 2024/09/20 |
| 工作标准传声器 4180 | 3055317 | 10Hz~25000Hz | $U$=(0.05~0.12)dB,$k$=2 | LSsx2023-07079<br>中国计量科学研究院 | 2024/06/05 |
| 信号发生器 AWA1650 | 089943 | 0.5Hz~20kHz | 电压：$U_{rel}$=0.2%,$k$=2<br>频率：$U_{rel}$=0.1%,$k$=2 | SXE20231181<br>广东省计量科学研究院 | 2024/07/30 |
| 有源耦合腔 AWA6153S+ | 2006409 | 10Hz~400kHz | 声压级:$U$=0.2dB,$k$=2<br>失真度:$U$=0.2%,$k$=2 | SSD202201977<br>广东省计量科学研究院 | 2024/08/18 |
| 测试声源(扬声器) AWA5511A | 090677 | 400Hz~20kHz | / | SSD202300428<br>广东省计量科学研究院 | 2024/07/26 |

# 说 明

## Directions

证书编号 C2310110830002
Certificate No.



| 名称/型号规格<br>Name/Model | 编号<br>Serial No. | 测量范围<br>Measurement range | 计量特性<br>Technical characteristic | 证书号/溯源机构<br>Certificate No./Traceability to | 有效期<br>Due date |
|---|---|---|---|---|---|
| 声频功率放大器<br>AWA5871 | 080649 | / | $U$=0.03dB,$k$=2 | SXE202301182<br>广东省计量科学研究院 | 2024/07/30 |

**6. 校准地点、环境条件：**

Place and environment condition during calibration

地点：本实验室力学室(6)

Place

温度：22.3℃

Temperature

相对湿度：52%

R.H.

CTI 华测检测

# 校 准 结 果

## Results of calibration

证书编号 C2310110830002
Certificate No.



1. 外观及工作正常性检查
Appearance and function check
正常 Normal

2. 指示声级调整（1000HZ）

| 声级计频率计权 | 声校准器频率 | 声校准器标准值 | 调校前声级计示值 | 调校后声级计示值 | 接受限 | 结论 |
|---|---|---|---|---|---|---|
| | (Hz) | （dB） | （dB） | （dB） | （dB） | Pass/Fail |
| A | 1000 | 94 | 94.0 | / | 93.7～94.3 | Pass |

3. 频率计权的声信号实验 （频率：1000Hz/A频率计权）

| 声压级标准值 | 声压级指示值 | 接受限 | 结论 |
|---|---|---|---|
| （dB） | （dB） | （dB） | Pass/Fail |
| 54 | 54.4 | 53.2～54.8 | Pass |
| 64 | 64.1 | 63.2～64.8 | Pass |
| 74 | 74.1 | 73.2～74.8 | Pass |
| 84 | 84.0 | 83.2～84.8 | Pass |
| 94 | 94.0 | 93.2～94.8 | Pass |
| 104 | 104.0 | 103.2～104.8 | Pass |
| 114 | 114.1 | 113.2～114.8 | Pass |

4. 本机自生噪音

| 测试类型 | 频率计权 | 实测值（dB） |
|---|---|---|
| 声信号 | A | 41.7 |
| 电信号 | A | 41.6 |
| | C | 46.1 |
| | Z | 48.4 |

5. 级线性（1dB～10dB内变化）： 起始点指示声级 90 dB

| 频率 | 测量项目 | 实测值 | 接受限 | 结论 |
|---|---|---|---|---|
| (Hz) | ---- | （dB） | （dB） | Pass/Fail |
| 1000 | 起始点以上每间隔10dB最大偏差 | +0.1 | ± 0.3 | Pass |
| | 起始点以下每间隔10dB最大偏差 | -0.1 | ± 0.3 | Pass |
| | 距上限5dB内每隔1dB最大偏差 | 0.0 | ± 0.3 | Pass |
| | 距下限5dB内每隔1dB最大偏差 | 0.0 | ± 0.3 | Pass |
| 8000 | 起始点以上每间隔10dB最大偏差 | +0.1 | ± 0.3 | Pass |
| | 起始点以下每间隔10dB最大偏差 | 0.0 | ± 0.3 | Pass |
| | 距上限5dB内每隔1dB最大偏差 | +0.1 | ± 0.3 | Pass |
| | 距下限5dB内每隔1dB最大偏差 | 0.0 | ± 0.3 | Pass |

# 校 准 结 果

## Results of calibration

证书编号 C2310110830002
Certificate No.



6. 频率计权

| 频率 (Hz) | A计权标准值 (dB) | 声压级指示值 (dB) | 接受限 (dB) | 结论 Pass/Fail |
|---|---|---|---|---|
| 20 | -50.5 | -50.6 | -48.5～-52.5 | Pass |
| 31.5 | -39.4 | -39.5 | -37.9～-40.9 | Pass |
| 63 | -26.2 | -26.2 | -25.2～-27.2 | Pass |
| 125 | -16.1 | -16.1 | -15.1～-17.1 | Pass |
| 250 | -8.6 | -8.6 | -7.6～-9.6 | Pass |
| 500 | -3.2 | -3.2 | -2.2～-4.2 | Pass |
| 1000 | 0.0 | 0.0 | +0.7～-0.7 | Pass |
| 2000 | +1.2 | +1.2 | +2.2～+0.2 | Pass |
| 4000 | +1.0 | +1.1 | +2.0～0.0 | Pass |
| 8000 | -1.1 | -1.2 | +0.4～-3.6 | Pass |
| 16000 | -6.6 | -9.7 | -4.1～-22.6 | Pass |
| 20000 | -9.3 | -21.3 | -6.3～-∞ | Pass |

| 频率 (Hz) | C计权标准值 (dB) | 声压级指示值 (dB) | 接受限 (dB) | 结论 Pass/Fail |
|---|---|---|---|---|
| 20 | -6.2 | -6.3 | -4.2～-8.2 | Pass |
| 31.5 | -3.0 | -3.0 | -1.5～-4.5 | Pass |
| 63 | -0.8 | -0.8 | +0.2～-1.8 | Pass |
| 125 | -0.2 | -0.2 | +0.8～-1.2 | Pass |
| 250 | 0.0 | 0.0 | +1.0～-1.0 | Pass |
| 500 | 0.0 | 0.0 | +1.0～-1.0 | Pass |
| 1000 | 0.0 | 0.0 | +0.7～-0.7 | Pass |
| 2000 | -0.2 | -0.2 | +0.8～-1.2 | Pass |
| 4000 | -0.8 | -0.8 | +0.2～-1.8 | Pass |
| 8000 | -3.0 | -3.1 | -1.5～-4.5 | Pass |
| 16000 | -8.5 | -11.6 | -6.0～-24.5 | Pass |
| 20000 | -11.2 | -23.5 | -8.2～-∞ | Pass |

# 校 准 结 果

## Results of calibration

证书编号 C2310110830002
Certificate No.



| 频率 (Hz) | Z计权标准值 (dB) | 声压级指示值 (dB) | 接受限 (dB) | 结论 Pass/Fail |
|---|---|---|---|---|
| 20 | 0.0 | -0.1 | +2.0～-2.0 | Pass |
| 31.5 | 0.0 | -0.1 | +1.5～-1.5 | Pass |
| 63 | 0.0 | 0.0 | +1.5～-1.5 | Pass |
| 125 | 0.0 | 0.0 | +1.0～-1.0 | Pass |
| 250 | 0.0 | 0.0 | +1.0～-1.0 | Pass |
| 500 | 0.0 | 0.0 | +1.0～-1.0 | Pass |
| 1000 | 0.0 | 0.0 | +0.7～-0.7 | Pass |
| 2000 | 0.0 | 0.0 | +1.0～-1.0 | Pass |
| 4000 | 0.0 | 0.0 | +1.0～-1.0 | Pass |
| 8000 | 0.0 | 0.0 | +1.5～-2.5 | Pass |
| 16000 | 0.0 | -0.1 | +2.5～-16.0 | Pass |
| 20000 | 0.0 | -0.3 | +3.0～-∞ | Pass |

7. 1kHz处的频率计权

| A计权参考声级 (dB) | C频率计权相对A频率计权的偏差 (dB) | Z频率计权相对A频率计权的偏差 (dB) | 结论 Pass/Fail | 接受限 (dB) |
|---|---|---|---|---|
| 94 | 0.0 | -0.1 | Pass | ± 0.2 |

8. F和S时间计权

| 衰减速率 (dB/s) | 实测值 (dB/s) | 接受限 (dB/s) | 结论 Pass/Fail |
|---|---|---|---|
| 快（F）计权 | 34.4 | 31.0～38.5 | Pass |
| 慢（S）计权 | 4.5 | 3.6～5.1 | Pass |

9. 猝发音响应（A计权）

| 猝发音持续时间 (ms) | (LAFmax-LA)标准值 (dB) | (LAFmax-LA)指示值 (dB) | 接受限 (dB) | 结论 Pass/Fail |
|---|---|---|---|---|
| 200 | -1.0 | -1.0 | -0.5～-1.5 | Pass |
| 2 | -18.0 | -18.0 | -17.0～-18.5 | Pass |
| 0.25 | -27.0 | -27.1 | -26.0～-30.0 | Pass |
| 猝发音持续时间 (ms) | (LASmax-LA)标准值 (dB) | (LSFmax-LA)指示值 (dB) | 接受限(dB) (dB) | 结论 Pass/Fail |
| 200 | -7.4 | -7.4 | -6.9～-7.9 | Pass |
| 2 | -27.0 | -27.1 | -26.0～-30.0 | Pass |

CTI 华测检测

# 校 准 结 果

## Results of calibration



证 书 编 号 C2310110830002
Certificate No.

注：仪器配传声器型号： AWA14421 ，传声器编号： 102497
本次校准结果的扩展不确定度为：
Expanded uncertainty of measurement:
声信号：20Hz～200Hz, $U$= 0.5 dB，$k$=2； 250Hz～400Hz, $U$= 0.4 dB，$k$=2； 500Hz～1250Hz, $U$= 0.4 dB，$k$=2； 1600Hz～10000Hz, $U$= 0.6 dB，$k$=2； 12.5kHz~20kHz， $U$= 1.0 dB;
正弦电信号： （0～140）dB，（20～20000）Hz，$U$= 0.3 dB，$k$=2；
猝发音电信号：（0～140）dB， （1000～8000）Hz，(0.25～1000)ms $U$= 0.3 dB，$k$=2；
时间计权 F 和 S： F:(25～40)dB/s，$U$= 3.2 dB/s，$k$=2； S:(1～10)dB/s，$U$= 0.3 dB/s，$k$=2。

备注：
Notes

1. 依据JJF1059.1-2012测量不确定度评定与表示。
   According to JJF1059.1-2012 Evaluation and Expression of Uncertainty in Measurement.
2. 校准项目符合1级技术要求。
   The calibrated measurand are accord with class 1 technical specifications.

以下空白
Blank below

华南国家计量测试中心
广东省计量科学研究院
SOUTH CHINA NATIONAL CENTER OF METROLOGY
GUANGDONG INSTITUTE OF METROLOGY

中国认可
国际互认
校准
CALIBRATION
CNAS L0730

# 校 准 证 书
# CALIBRATION CERTIFICATE

证书编号 SXE202330665 第 1 页，共 4 页
Certificate No. Page of

委托方 上峰检测认证有限公司
Client

委托方联络信息 ----
Contact Information

计量器具名称 声校准器
Description

型号/规格 QC-10
Model/Type

制造厂 QUEST
Manufacturer

出厂编号 QI9010183 设备管理编号 ----
Serial No. Equipment No.

接收日期 2023 年 09 月 15 日
Date of Receipt Y M D

结果 符合JJG 176-2022（1级）技术要求
Results Comply with JJG 176-2022(for Class 1)

校准日期 2023 年 09 月 20 日
Date of Calibration Y M D

批 准 人 李敏毅
Approved Signatory

核 验 陈沈理
Reviewed by

校 准 何卓斌
Calibrated by

证书专用章
Stamp

扫一扫查真伪

本中心地址：中国广州市广园中路松柏东街30号 邮政编码：510405
电话：(8620)86594172 传真：(8620)86590743 投诉电话：(8620)36611242 E-mail：scm@scm.com.cn
Add: No.30, Songbai East Street, Guangyuan Middle Road, Guangzhou, Guangdong, China
Post Code: 510405 Tel: (8620)86594172 Fax: (8620)86590743 Complaint Tel: (8620)36611242
证书真伪查询：www.scm.com.cn；cert.scm.com.cn Certificate AuthenticityIdentify: www.scm.com.cn; cert.scm.com.cn

# 说　明

证书编号 SXE202330665
Certificate No.

**DIRECTIONS**



1. 本中心是国家市场监督管理总局在华南地区设立的国家法定计量检定机构，本中心的质量管理体系符合ISO/IEC 17025:2017标准的要求。
This laboratory is the National Legal Metrological Verification Institution in southern China set up by the State Administration for Market Regulation. The quality system is in accordance with ISO/IEC 17025:2017.

2. 本中心所出具的数据均可溯源至国家计量基准和/或国际单位制(SI)。
All data issued by this laboratory are traceable to national primary standards and/or International System of Units (SI).

3. 校准地点、环境条件：
Place and environmental conditions of the calibration:
地点 Place 声学/振动实验室 Acoustics/Vibration Lab.　温度 Temperature (25±1) ℃　相对湿度 R.H. (30～40) %

4. 本次校准的技术依据：
Reference documents for the calibration:
JJG 176-2022 声校准器检定规程　V.R. of Sound Calibrators

5. 本次校准所使用的主要计量标准器具：
Major standards of measurement used in the calibration:

| 设备名称/型号规格/测量范围 Name of Equipment /Model/Type/Range | 编号 Serial No. | 证书号/有效期/溯源单位 Certificate No./Due Date /Traceability to | 计量特性 Metrological Characteristic |
|---|---|---|---|
| 实验室标准传声器 Lab Standard Microphones /4180/(10～25600)Hz | 2889895 | LSsx2022-08290 /2023-09-20 /国家计量院 | 声压灵敏度级: $U$=(0.05～0.12) dB ( $k$ =2) Sound pressure sensitivity level: $U$=(0.05～0.12) dB ( $k$ =2) |
| 动态信号分析仪 Dynamical Signal Analyzer /3560C（3110模块）/0.1 Hz～200 kHz | 2392397 | SXE202300516 /2024-04-18 /本中心 | 电压:$U_{rel}$=0.2%,频率:$U_{rel}$=0.002%( $k$ =2) Voltage:$U_{rel}$=0.2%,Frequency :$U_{rel}$=0.002%( $k$ =2) |
| 自动失真仪 Automatic Distortion Meter Calibrator /ZQ4121A/0.01%～30% | 00297 | WWD202301557 /2024-05-09 /本中心 | ±10% |

注：
Note:
1. 本证书校准结果只与受校准仪器有关。 The results relate only to the items calibrated.
2. 未经本机构书面批准，不得部分复制此证书。 This certificate shall not be reproduced except in full, without the written approval of our laboratory.
3. “委托方”、“委托方联络信息”由委托方提供，“制造厂”、“型号规格”、“出厂编号”以及“设备编号”为仪器上标注，委托方对上面内容如有异议，须在收到证书后二十个工作日内提出。
The information **Client** and **Contact Information** are provided by client, and the **Manufacturer**, **Model/Type**, **Serial No.** and **Equipment No.** are marked on the items. Client shall submit any objection within 20 working days after receiving the certificate for the information above.
4. 本次校准日期视为发布日期。 The calibration date is the date of issue of the certificate.

# 校 准 结 果
# RESULTS OF CALIBRATION

证书编号 SXE202330665 原始记录号 SXE202330665 第 3 页,共 4 页
Certificate No. Record No. Page of

1 外观： 符合要求

Apparent inspection: Pass

2 声压级：见表1

Sound Pressure Level: Shown in table 1

表1 Table 1

| 频率/Hz<br>Frequency | 标称值/dB<br>Nominal Value | 实测值/dB<br>Measured Value | 接受限/dB<br>Acceptance limit | 结论<br>Conclusion |
|---|---|---|---|---|
| 1000 | 114 | 114.10 | ±0.25 | 符合要求(Pass) |

3 频率：见表2

Frequency: Shown in table 2

表2 Table 2

| 标称值/Hz<br>Nominal Value | 实测值/Hz<br>Measured Value | 接受限/%<br>Acceptance limit | 结论<br>Conclusion |
|---|---|---|---|
| 1000 | 1001.09 | ±0.7 | 符合要求(Pass) |

4 总失真+噪声： 见表3

Total distortion + noise: Shown in table 3

表3 Table 3

| 频率/Hz<br>Frequency | 声压级/dB<br>Sound Pressure Level | 总失真+噪声/%<br>Total Distortion+ noise | 接受限/%<br>Acceptance limit | 结论<br>Conclusion |
|---|---|---|---|---|
| 1000 | 114 | 0.2 | ≤2.5 | 符合要求(Pass) |

# 校 准 结 果
# RESULTS OF CALIBRATION

证书编号 SXE202330665　　原始记录号 SXE202330665　　第 4 页,共 4 页
Certificate No.　　Record No.　　Page　of

说明：

Note:

1 测量结果扩展不确定度：

Expanded uncertainty of measurement results:

声压级：$U$=0.15 dB

Sound Pressure Level

频率：$U_{rel}$=0.1%

Frequency

总失真+噪声：U=0.4%

Total distortion + noise

包含因子：$k$=2

Coverage factor

2 本证书中给出的扩展不确定度依据JJF1059.1-2012《测量不确定度评定与表示》评定，由合成标准不确定度乘以包含概率约为95%时对应的包含因子$k$得到。

The expanded uncertainty given in this certificate is evaluated according to JJF 1059.1-2012 "Evaluation and Expression of Uncertainty in Measurement", which is obtained by multiplying the combined standard uncertainty by the coverage factor $k$ corresponding to the coverage probability of about 95%.

3 校准结果符合性判定依据JJF 1094-2002《测量仪器特性评定》之5.3.1和JJG 176-2022《声校准器检定规程》。

Decision rules of conformity are JJF 1094-2002 *Evaluation of the Characteristics of Measuring Instruments* (5.3.1) and JJG 176-2022 *V.R. of Sound Calibrators*.

4 结论：被校准仪器校准结果符合 JJG 176-2022 (1级)全部后续项目技术要求。

Conclusion：The data of instrument calibrated comply with the technical characteristics of all subsequent items in JJG 176-2022 (for Class 1).

5 按照所依据技术文件的规定，建议复校时间间隔不超过1年。更换重要部件、维修或对仪器性能有怀疑时，应及时校准。

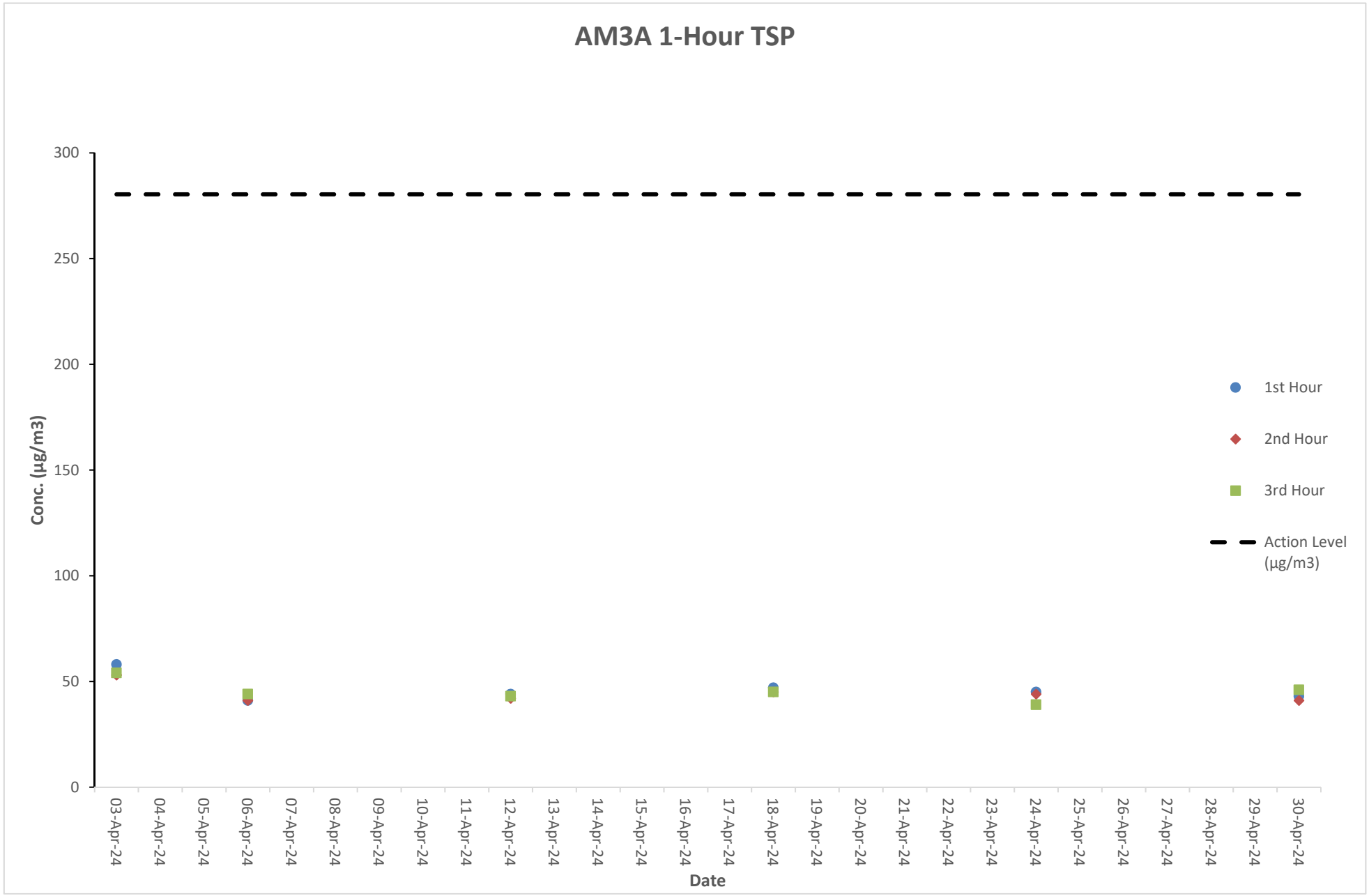
According to the demand of reference document, next calibration is proposed within 1 year. In case of replacement of important parts, maintenance or doubt on the performance of the instrument, it shall be calibrated in time.

# G. Graphical Plots of the Monitoring Results

**Air Quality Monitoring Result at Station AM3A (1-hour TSP)**

| Date | Weather Condition | Time | | Conc. (μg/m3) | | | Action Level | Limit Level |
|---|---|---|---|---|---|---|---|---|
| | | Start | Finish | 1st Hour | 2nd Hour | 3rd Hour | | |
| 03-Apr-24 | Fine | 14:07 | 17:07 | 58 | 53 | 54 | 280.4 | 500 |
| 06-Apr-24 | Fine | 08:09 | 11:09 | 41 | 41 | 44 | 280.4 | 500 |
| 12-Apr-24 | Fine | 14:05 | 17:05 | 44 | 42 | 43 | 280.4 | 500 |
| 18-Apr-24 | Cloudy | 08:00 | 11:00 | 47 | 45 | 45 | 280.4 | 500 |
| 24-Apr-24 | Cloudy | 14:02 | 17:02 | 45 | 44 | 39 | 280.4 | 500 |
| 30-Apr-24 | Cloudy | 08:02 | 11:02 | 43 | 41 | 46 | 280.4 | 500 |

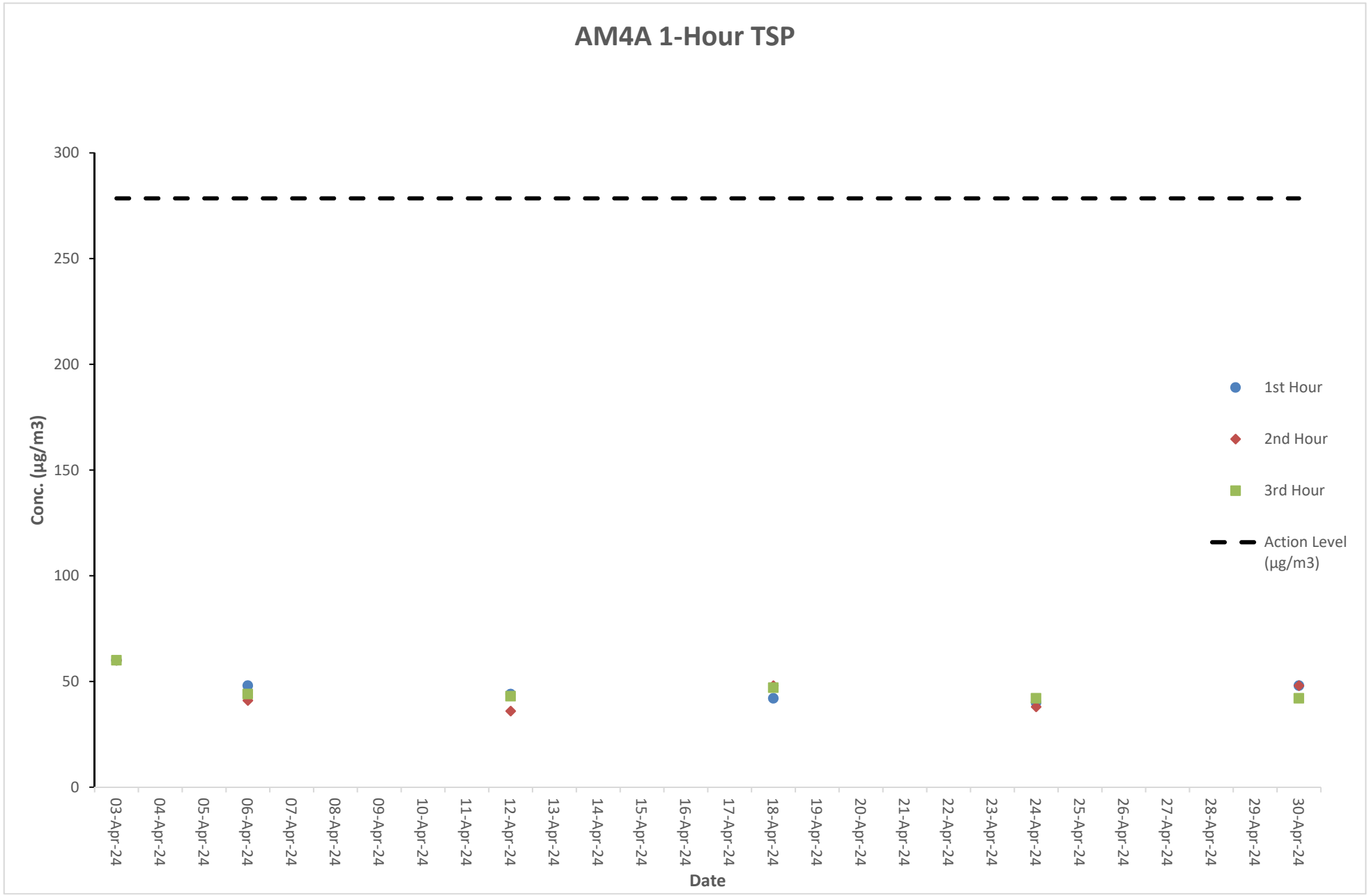
**Graphical Presentation of Air Quality Monitoring Result at Station AM3A (1-hour TSP)**



**Air Quality Monitoring Result at Station AM4A (1-hour TSP)**

| Date | Weather Condition | Time | | Conc. (μg/m3) | | | Action Level | Limit Level |
|---|---|---|---|---|---|---|---|---|
| | | Start | Finish | 1st Hour | 2nd Hour | 3rd Hour | | |
| 03-Apr-24 | Fine | 14:15 | 17:15 | 60 | 60 | 60 | 278.5 | 500 |
| 06-Apr-24 | Fine | 08:17 | 11:17 | 48 | 41 | 44 | 278.5 | 500 |
| 12-Apr-24 | Fine | 14:13 | 17:13 | 44 | 36 | 43 | 278.5 | 500 |
| 18-Apr-24 | Cloudy | 08:08 | 11:08 | 42 | 48 | 47 | 278.5 | 500 |
| 24-Apr-24 | Cloudy | 14:10 | 17:10 | 40 | 38 | 42 | 278.5 | 500 |
| 30-Apr-24 | Cloudy | 08:10 | 11:10 | 48 | 48 | 42 | 278.5 | 500 |

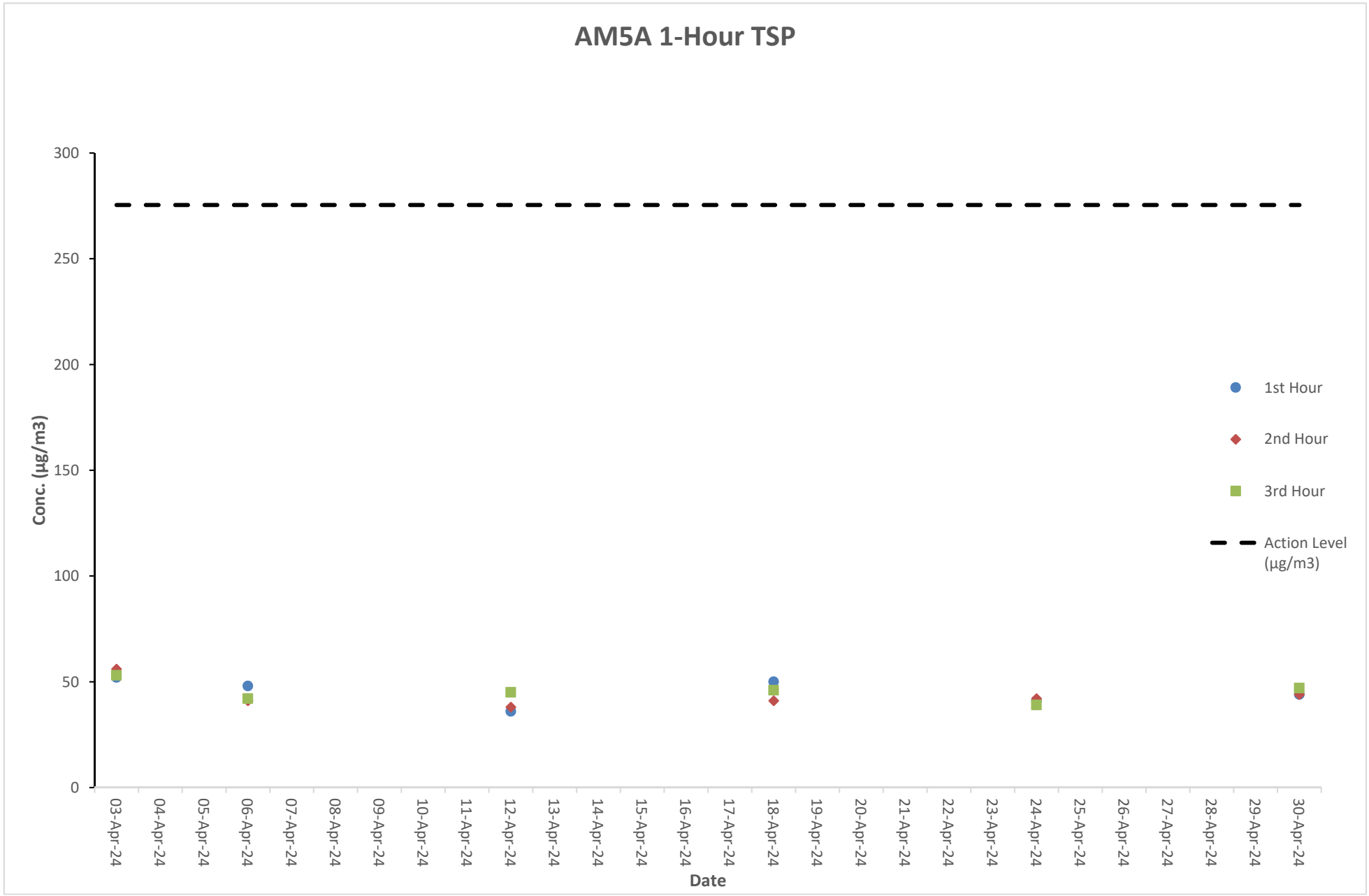
**Graphical Presentation of Air Quality Monitoring Result at Station AM4A (1-hour TSP)**



**Air Quality Monitoring Result at Station AM5A (1-hour TSP)**

| Date | Weather Condition | Time | | Conc. (μg/m3) | | | Action Level | Limit Level |
|---|---|---|---|---|---|---|---|---|
| | | Start | Finish | 1st Hour | 2nd Hour | 3rd Hour | | |
| 03-Apr-24 | Fine | 14:30 | 17:30 | 52 | 56 | 53 | 275.4 | 500 |
| 06-Apr-24 | Fine | 08:34 | 11:34 | 48 | 41 | 42 | 275.4 | 500 |
| 12-Apr-24 | Fine | 14:28 | 17:28 | 36 | 38 | 45 | 275.4 | 500 |
| 18-Apr-24 | Cloudy | 08:25 | 11:25 | 50 | 41 | 46 | 275.4 | 500 |
| 24-Apr-24 | Cloudy | 14:25 | 17:25 | 41 | 42 | 39 | 275.4 | 500 |
| 30-Apr-24 | Cloudy | 08:27 | 11:27 | 44 | 44 | 47 | 275.4 | 500 |

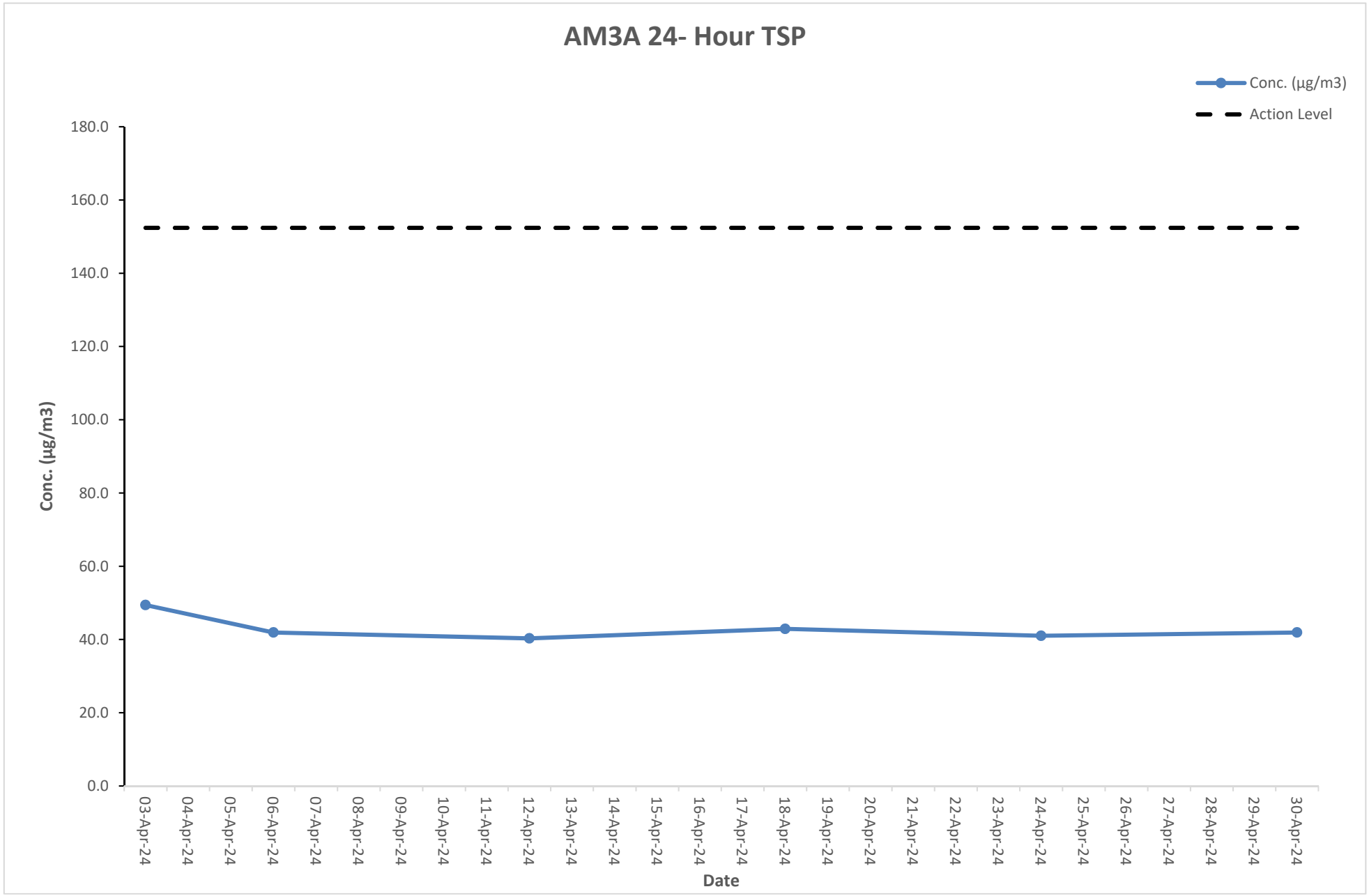
**Graphical Presentation of Air Quality Monitoring Result at Station AM5A (1-hour TSP)**



**Air Quality Monitoring Result at Station AM3A (24-hour TSP)**

| Start | | Finish | | Filter Weight (g) | | Elapsed Time Reading | | Sampling | Flow Rate ($m^3$/min) | | | Conc. | Weather | Action | Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Time | Date | Time | Initial | Final | Initial | Final | Time (hrs) | Initial | Final | Average | (µg/m3) | Condition | Level | Level |
| 03-Apr-24 | 10:00AM | 04-Apr-24 | 10:00AM | 2.8073 | 2.8868 | 6566.8 | 6590.8 | 24 | 1.12 | 1.12 | 1.12 | 49.4 | Sunny | 152.4 | 260 |
| 06-Apr-24 | 10:00AM | 07-Apr-24 | 10:00AM | 2.8031 | 2.8704 | 6590.8 | 6614.8 | 24 | 1.12 | 1.12 | 1.12 | 41.9 | Rainy | 152.4 | 260 |
| 12-Apr-24 | 10:00AM | 13-Apr-24 | 10:00AM | 2.8022 | 2.8671 | 6614.8 | 6638.8 | 24 | 1.12 | 1.12 | 1.12 | 40.3 | Sunny | 152.4 | 260 |
| 18-Apr-24 | 10:00AM | 19-Apr-24 | 10:00AM | 2.8016 | 2.8706 | 6638.8 | 6662.8 | 24 | 1.12 | 1.12 | 1.12 | 42.9 | Rainy | 152.4 | 260 |
| 24-Apr-24 | 10:00AM | 25-Apr-24 | 10:00AM | 2.8063 | 2.8722 | 6662.8 | 6686.8 | 24 | 1.12 | 1.12 | 1.12 | 41.0 | Cloudy | 152.4 | 260 |
| 30-Apr-24 | 10:00AM | 01-May-24 | 10:00AM | 2.8067 | 2.8742 | 6686.8 | 6710.8 | 24 | 1.12 | 1.12 | 1.12 | 41.9 | Rainy | 152.4 | 260 |

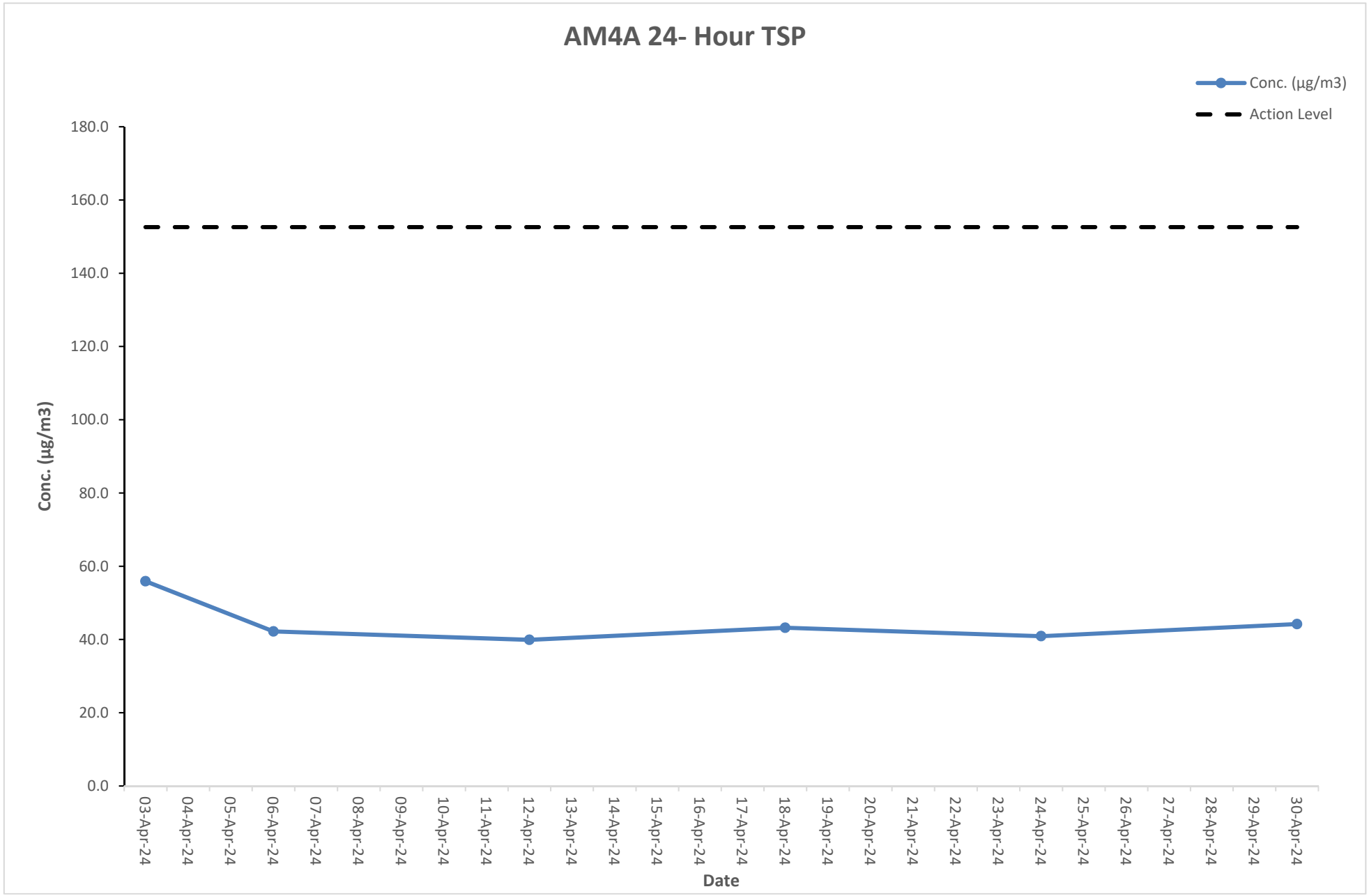
**Graphical Presentation of Air Quality Monitoring Result at Station AM3A (24-hour TSP)**



**Air Quality Monitoring Result at Station AM4A (24-hour TSP)**

| Start | | Finish | | Filter Weight (g) | | Elapsed Time Reading | | Sampling | Flow Rate ($m^3$/min) | | | Conc. | Weather | Action | Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Time | Date | Time | Initial | Final | Initial | Final | Time (hrs) | Initial | Final | Average | (µg/m3) | Condition | Level | Level |
| 03-Apr-24 | 10:00AM | 04-Apr-24 | 10:00AM | 2.8056 | 2.8956 | 6986.4 | 7010.4 | 24 | 1.12 | 1.12 | 1.12 | 55.9 | Sunny | 152.6 | 260 |
| 06-Apr-24 | 10:00AM | 07-Apr-24 | 10:00AM | 2.8051 | 2.8731 | 7010.4 | 7034.4 | 24 | 1.12 | 1.12 | 1.12 | 42.2 | Rainy | 152.6 | 260 |
| 12-Apr-24 | 10:00AM | 13-Apr-24 | 10:00AM | 2.8050 | 2.8692 | 7034.4 | 7058.4 | 24 | 1.12 | 1.12 | 1.12 | 39.9 | Sunny | 152.6 | 260 |
| 18-Apr-24 | 10:00AM | 19-Apr-24 | 10:00AM | 2.8015 | 2.8711 | 7058.4 | 7082.4 | 24 | 1.12 | 1.12 | 1.12 | 43.2 | Rainy | 152.6 | 260 |
| 24-Apr-24 | 10:00AM | 25-Apr-24 | 10:00AM | 2.8033 | 2.8692 | 7082.4 | 7106.4 | 24 | 1.12 | 1.12 | 1.12 | 40.9 | Cloudy | 152.6 | 260 |
| 30-Apr-24 | 10:00AM | 01-May-24 | 10:00AM | 2.8017 | 2.8729 | 7106.4 | 7130.4 | 24 | 1.12 | 1.12 | 1.12 | 44.2 | Rainy | 152.6 | 260 |

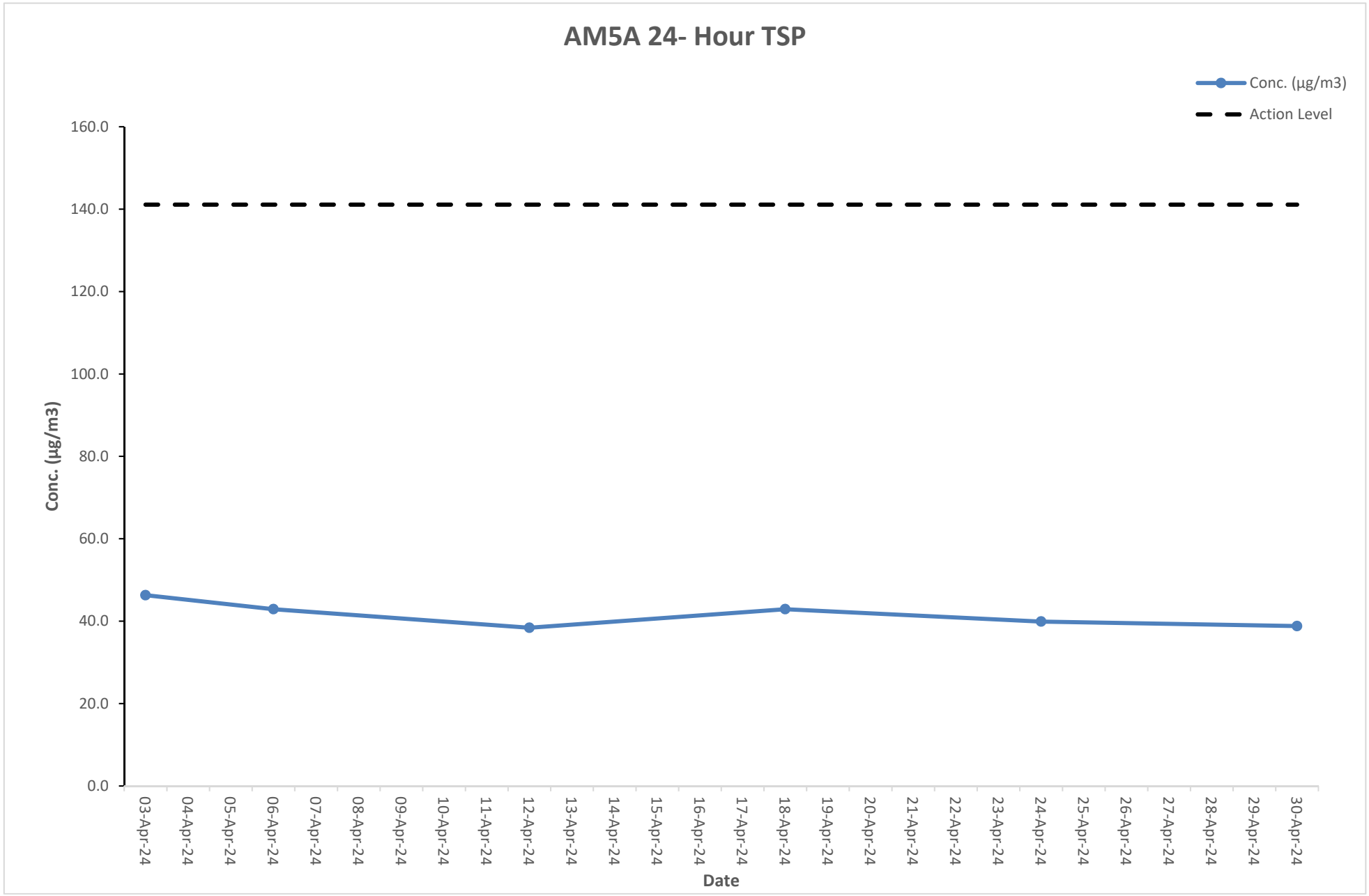
**Graphical Presentation of Air Quality Monitoring Result at Station AM4A (24-hour TSP)**



**Air Quality Monitoring Result at Station AM5A (24-hour TSP)**

| Start | | Finish | | Filter Weight (g) | | Elapsed Time Reading | | Sampling | Flow Rate ($m^3$/min) | | | Conc. | Weather | Action | Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Time | Date | Time | Initial | Final | Initial | Final | Time (hrs) | Initial | Final | Average | (µg/m3) | Condition | Level | Level |
| 03-Apr-24 | 10:00AM | 04-Apr-24 | 10:00AM | 2.8015 | 2.8760 | 7124.6 | 7148.6 | 24 | 1.12 | 1.12 | 1.12 | 46.3 | Sunny | 141.1 | 260 |
| 06-Apr-24 | 10:00AM | 07-Apr-24 | 10:00AM | 2.8041 | 2.8732 | 7148.6 | 7172.6 | 24 | 1.12 | 1.12 | 1.12 | 42.9 | Rainy | 141.1 | 260 |
| 12-Apr-24 | 10:00AM | 13-Apr-24 | 10:00AM | 2.8074 | 2.8692 | 7172.6 | 7196.6 | 24 | 1.12 | 1.12 | 1.12 | 38.4 | Sunny | 141.1 | 260 |
| 18-Apr-24 | 10:00AM | 19-Apr-24 | 10:00AM | 2.8060 | 2.8750 | 7196.6 | 7220.6 | 24 | 1.12 | 1.12 | 1.12 | 42.9 | Rainy | 141.1 | 260 |
| 24-Apr-24 | 10:00AM | 25-Apr-24 | 10:00AM | 2.8020 | 2.8663 | 7220.6 | 7244.6 | 24 | 1.12 | 1.12 | 1.12 | 39.9 | Cloudy | 141.1 | 260 |
| 30-Apr-24 | 10:00AM | 01-May-24 | 10:00AM | 2.8027 | 2.8651 | 7244.6 | 7268.6 | 24 | 1.12 | 1.12 | 1.12 | 38.8 | Rainy | 141.1 | 260 |

**Graphical Presentation of Air Quality Monitoring Result at Station AM5A (24-hour TSP)**

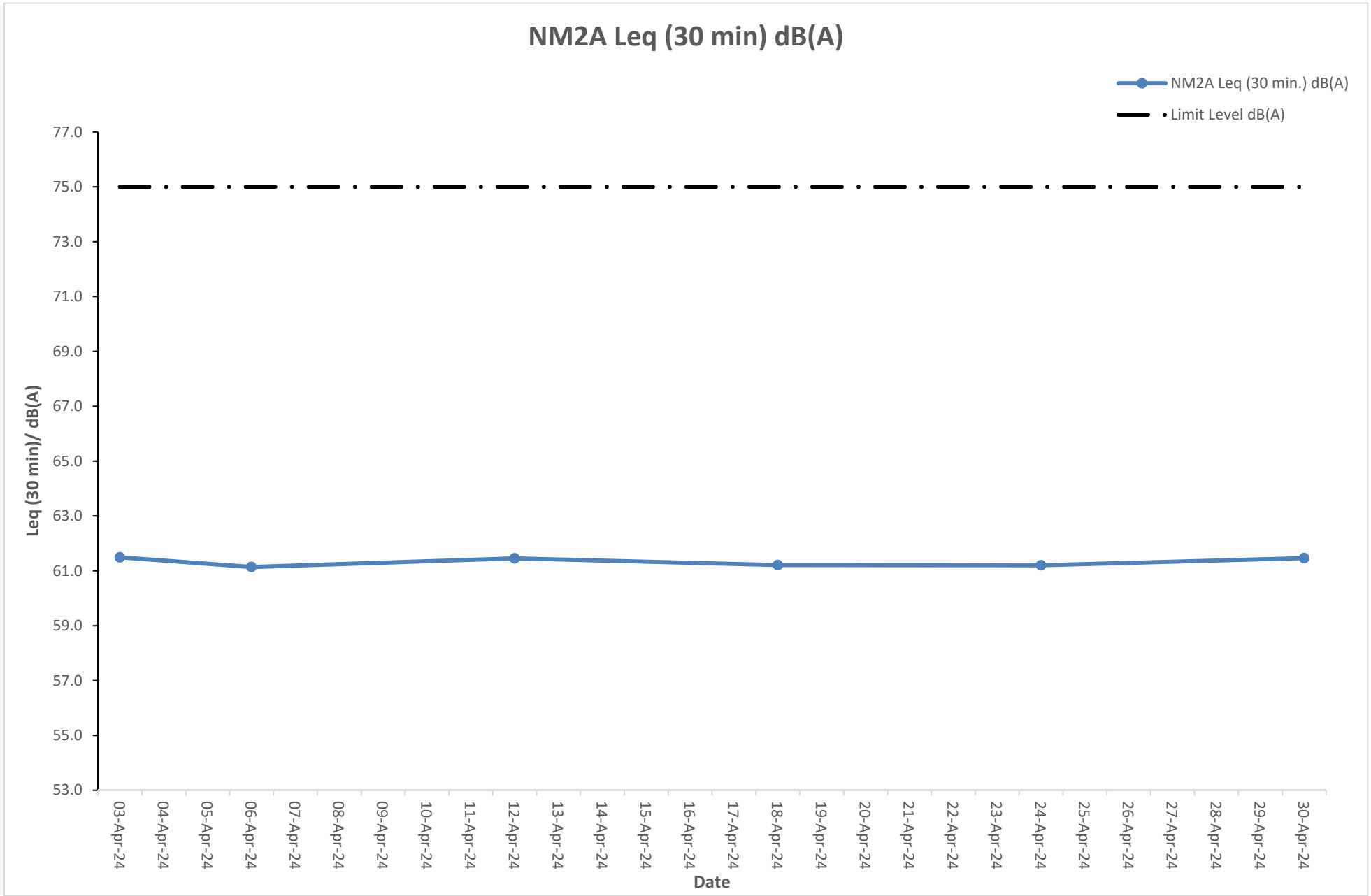


**Noise Monitoring Result at Station NM2A**

| Date | Time | Measured L10 dB(A) | Measured L90 dB(A) | Leq (30 min.) dB(A) |
|---|---|---|---|---|
| 03-Apr-24 | 14:37 | 62.7 | 58.8 | 61.5 |
| 03-Apr-24 | 14:42 | 63.0 | 59.3 | |
| 03-Apr-24 | 14:47 | 63.4 | 60.1 | |
| 03-Apr-24 | 14:52 | 63.0 | 59.6 | |
| 03-Apr-24 | 14:57 | 63.2 | 60.1 | |
| 03-Apr-24 | 15:02 | 63.0 | 58.9 | |
| 06-Apr-24 | 8:39 | 63.5 | 58.7 | 61.1 |
| 06-Apr-24 | 8:44 | 62.5 | 59.5 | |
| 06-Apr-24 | 8:49 | 62.2 | 60.0 | |
| 06-Apr-24 | 8:54 | 62.1 | 58.9 | |
| 06-Apr-24 | 8:59 | 62.2 | 58.7 | |
| 06-Apr-24 | 9:04 | 63.0 | 59.7 | |
| 12-Apr-24 | 14:35 | 62.3 | 59.5 | 61.5 |
| 12-Apr-24 | 14:40 | 63.3 | 59.1 | |
| 12-Apr-24 | 14:45 | 62.7 | 59.5 | |
| 12-Apr-24 | 14:50 | 62.5 | 60.0 | |
| 12-Apr-24 | 14:55 | 62.3 | 58.7 | |
| 12-Apr-24 | 15:00 | 63.2 | 59.5 | |
| 18-Apr-24 | 8:30 | 62.8 | 60.0 | 61.2 |
| 18-Apr-24 | 8:35 | 62.2 | 58.7 | |
| 18-Apr-24 | 8:40 | 63.5 | 59.8 | |
| 18-Apr-24 | 8:45 | 63.2 | 59.7 | |
| 18-Apr-24 | 8:50 | 63.5 | 58.9 | |
| 18-Apr-24 | 8:55 | 63.4 | 59.3 | |
| 24-Apr-24 | 14:32 | 63.0 | 59.7 | 61.2 |
| 24-Apr-24 | 14:37 | 62.7 | 59.9 | |
| 24-Apr-24 | 14:42 | 63.5 | 59.3 | |
| 24-Apr-24 | 14:47 | 63.0 | 58.9 | |
| 24-Apr-24 | 14:52 | 62.6 | 60.0 | |
| 24-Apr-24 | 14:57 | 63.0 | 58.8 | |
| 30-Apr-24 | 8:32 | 63.5 | 59.7 | 61.5 |
| 30-Apr-24 | 8:37 | 62.2 | 59.6 | |
| 30-Apr-24 | 8:42 | 62.4 | 59.3 | |
| 30-Apr-24 | 8:47 | 63.2 | 59.6 | |
| 30-Apr-24 | 8:52 | 62.4 | 58.7 | |
| 30-Apr-24 | 8:57 | 62.8 | 59.8 | |

The station set-up of a façade measurement at station NM2A.

**Graphical Presentation of Noise Monitoring Result at Station NM2A**

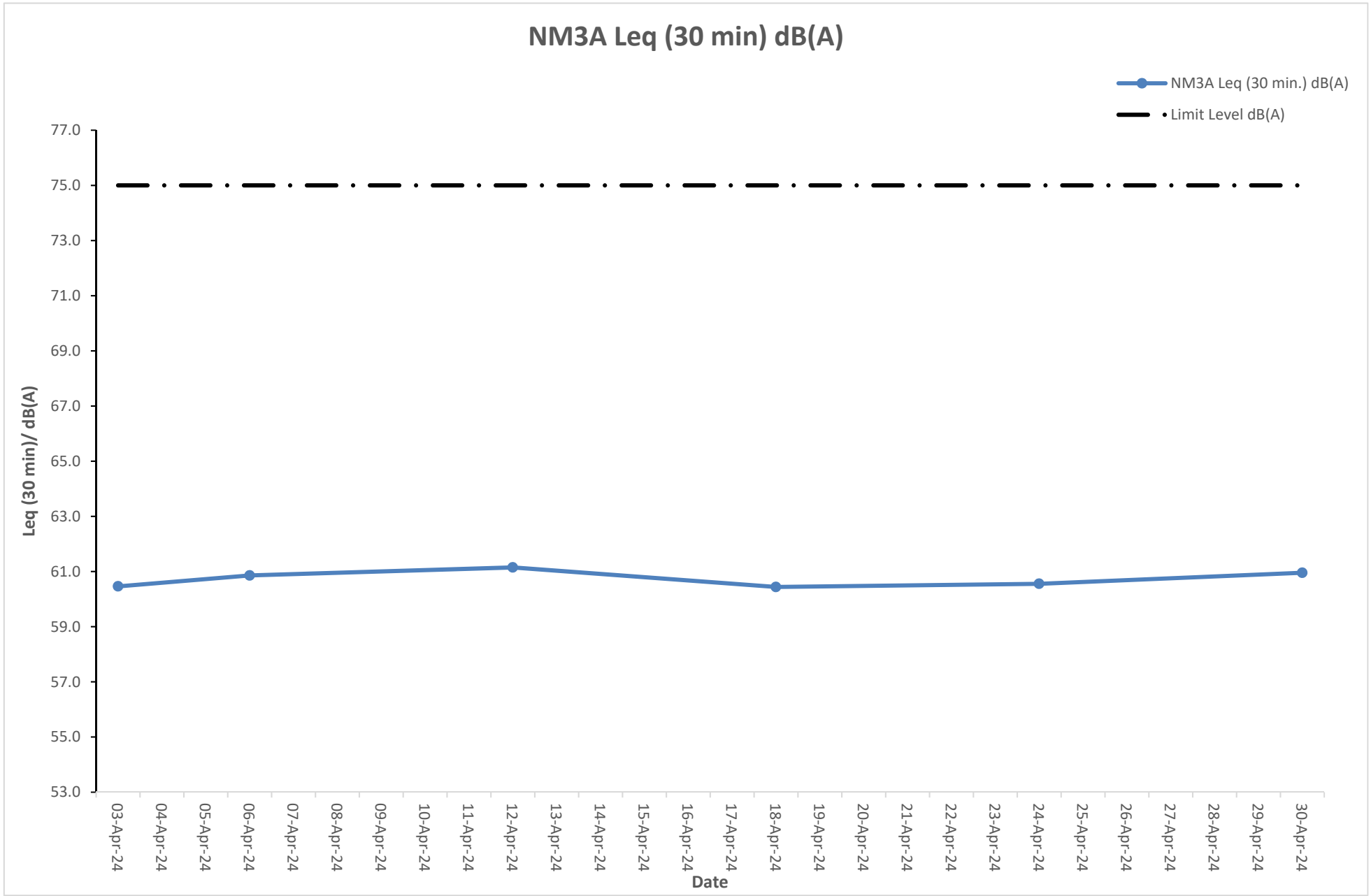


**Noise Monitoring Result at Station NM3A**

| Date | Time | Measured L10 dB(A) | Measured L90 dB(A) | Leq (30 min.) dB(A) |
|---|---|---|---|---|
| 03-Apr-24 | 16:07 | 62.5 | 56.6 | 60.5 |
| 03-Apr-24 | 16:12 | 62.2 | 57.8 | |
| 03-Apr-24 | 16:17 | 63.3 | 56.8 | |
| 03-Apr-24 | 16:22 | 63.1 | 56.7 | |
| 03-Apr-24 | 16:27 | 63.2 | 57.1 | |
| 03-Apr-24 | 16:32 | 63.6 | 57.2 | |
| 06-Apr-24 | 10:12 | 63.0 | 57.1 | 60.9 |
| 06-Apr-24 | 10:17 | 62.7 | 57.3 | |
| 06-Apr-24 | 10:22 | 62.6 | 56.9 | |
| 06-Apr-24 | 10:27 | 62.8 | 57.2 | |
| 06-Apr-24 | 10:32 | 63.8 | 57.3 | |
| 06-Apr-24 | 10:37 | 63.5 | 57.0 | |
| 12-Apr-24 | 16:05 | 62.8 | 56.1 | 61.1 |
| 12-Apr-24 | 16:10 | 62.4 | 57.0 | |
| 12-Apr-24 | 16:15 | 63.2 | 56.2 | |
| 12-Apr-24 | 16:20 | 63.8 | 56.4 | |
| 12-Apr-24 | 16:25 | 63.0 | 57.8 | |
| 12-Apr-24 | 16:30 | 63.2 | 56.4 | |
| 18-Apr-24 | 10:03 | 63.8 | 56.7 | 60.4 |
| 18-Apr-24 | 10:08 | 63.6 | 56.2 | |
| 18-Apr-24 | 10:13 | 63.0 | 56.5 | |
| 18-Apr-24 | 10:18 | 63.8 | 56.9 | |
| 18-Apr-24 | 10:23 | 62.9 | 57.8 | |
| 18-Apr-24 | 10:28 | 62.7 | 57.2 | |
| 24-Apr-24 | 16:02 | 63.5 | 56.3 | 60.6 |
| 24-Apr-24 | 16:07 | 61.9 | 57.7 | |
| 24-Apr-24 | 16:12 | 63.0 | 56.0 | |
| 24-Apr-24 | 16:17 | 62.8 | 57.7 | |
| 24-Apr-24 | 16:22 | 62.3 | 56.1 | |
| 24-Apr-24 | 16:27 | 63.4 | 57.0 | |
| 30-Apr-24 | 10:14 | 63.1 | 57.6 | 61.0 |
| 30-Apr-24 | 10:19 | 62.7 | 56.7 | |
| 30-Apr-24 | 10:24 | 62.9 | 57.0 | |
| 30-Apr-24 | 10:29 | 62.4 | 57.3 | |
| 30-Apr-24 | 10:34 | 63.7 | 56.7 | |
| 30-Apr-24 | 10:39 | 63.2 | 57.0 | |

The station set-up of a façade measurement at station NM3A.

**Graphical Presentation of Noise Monitoring Result at Station NM3A**

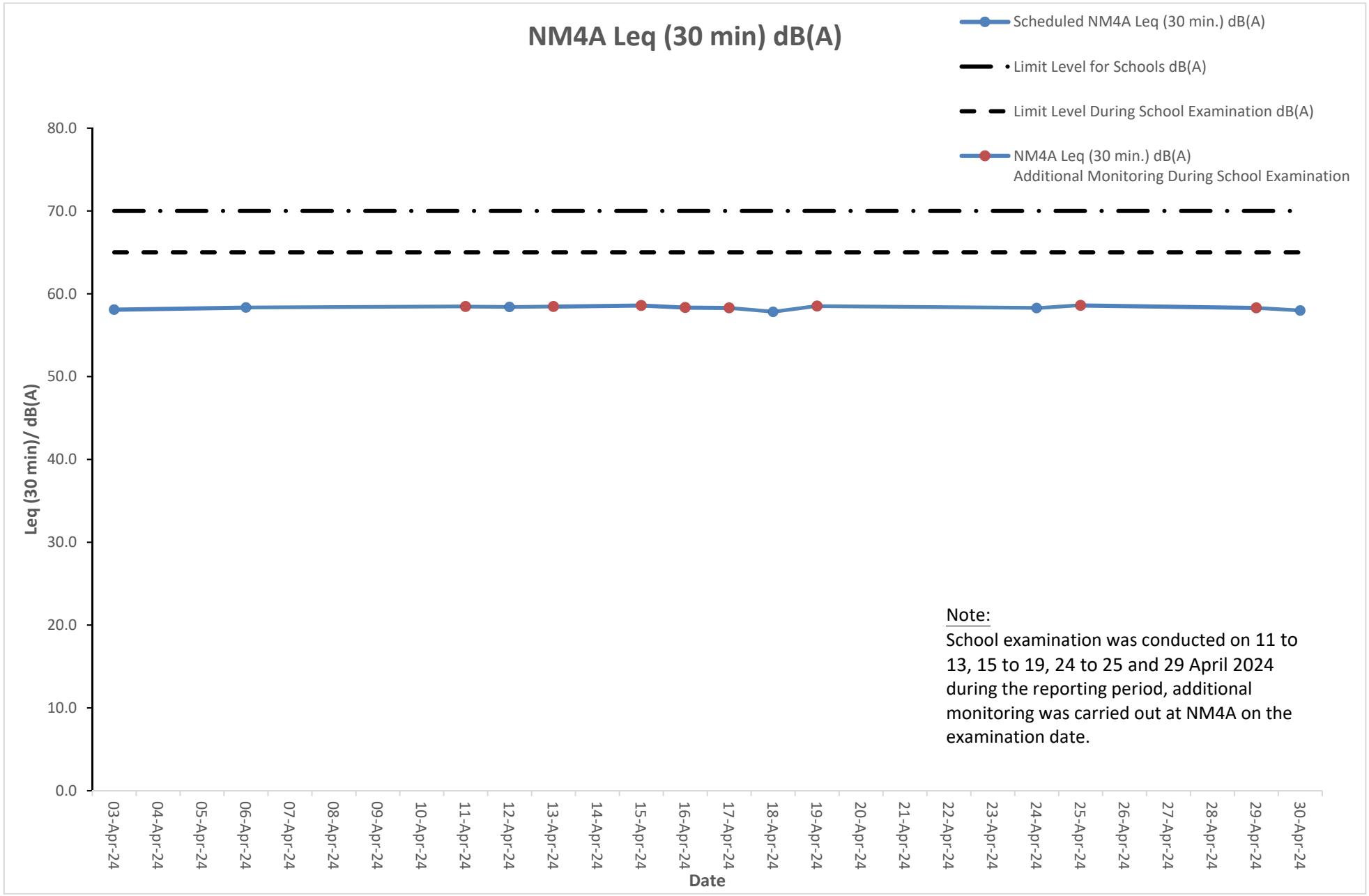


**Noise Monitoring Result at Station NM4A**

| Date | Time | Measured L10 dB(A) | Measured L90 dB(A) | Leq (30 min.) dB(A) |
|---|---|---|---|---|
| 03-Apr-24 | 16:42 | 59.9 | 56.3 | 58.1 |
| 03-Apr-24 | 16:47 | 60.6 | 55.9 | |
| 03-Apr-24 | 16:52 | 60.3 | 55.9 | |
| 03-Apr-24 | 16:57 | 59.9 | 56.0 | |
| 03-Apr-24 | 17:02 | 59.3 | 56.0 | |
| 03-Apr-24 | 17:07 | 59.7 | 56.8 | |
| 06-Apr-24 | 10:47 | 59.4 | 55.9 | 58.3 |
| 06-Apr-24 | 10:52 | 59.2 | 56.6 | |
| 06-Apr-24 | 10:57 | 60.1 | 56.2 | |
| 06-Apr-24 | 11:02 | 60.4 | 56.6 | |
| 06-Apr-24 | 11:07 | 60.3 | 56.9 | |
| 06-Apr-24 | 11:12 | 60.1 | 56.2 | |
| 12-Apr-24 | 16:40 | 59.5 | 57.1 | 58.4 |
| 12-Apr-24 | 16:45 | 59.3 | 56.1 | |
| 12-Apr-24 | 16:50 | 60.5 | 56.7 | |
| 12-Apr-24 | 16:55 | 60.1 | 56.7 | |
| 12-Apr-24 | 17:00 | 59.9 | 55.9 | |
| 12-Apr-24 | 17:05 | 60.6 | 56.1 | |
| 18-Apr-24 | 10:38 | 59.5 | 56.7 | 57.8 |
| 18-Apr-24 | 10:43 | 59.7 | 55.9 | |
| 18-Apr-24 | 10:48 | 60.4 | 56.9 | |
| 18-Apr-24 | 10:53 | 59.3 | 57.0 | |
| 18-Apr-24 | 10:58 | 60.5 | 56.3 | |
| 18-Apr-24 | 11:03 | 59.4 | 55.7 | |
| 24-Apr-24 | 16:37 | 59.6 | 56.8 | 58.3 |
| 24-Apr-24 | 16:42 | 60.2 | 56.7 | |
| 24-Apr-24 | 16:47 | 59.3 | 57.0 | |
| 24-Apr-24 | 16:52 | 60.0 | 56.3 | |
| 24-Apr-24 | 16:57 | 60.5 | 56.2 | |
| 24-Apr-24 | 17:02 | 60.1 | 56.0 | |
| 30-Apr-24 | 10:49 | 59.9 | 56.7 | 58.0 |
| 30-Apr-24 | 10:54 | 60.2 | 56.7 | |
| 30-Apr-24 | 10:59 | 59.4 | 57.1 | |
| 30-Apr-24 | 11:04 | 59.2 | 56.7 | |
| 30-Apr-24 | 11:09 | 60.5 | 56.8 | |
| 30-Apr-24 | 11:14 | 60.0 | 56.0 | |

The station set-up of a façade measurement at station NM4A.

**Graphical Presentation of Noise Monitoring Result at Station NM4A**



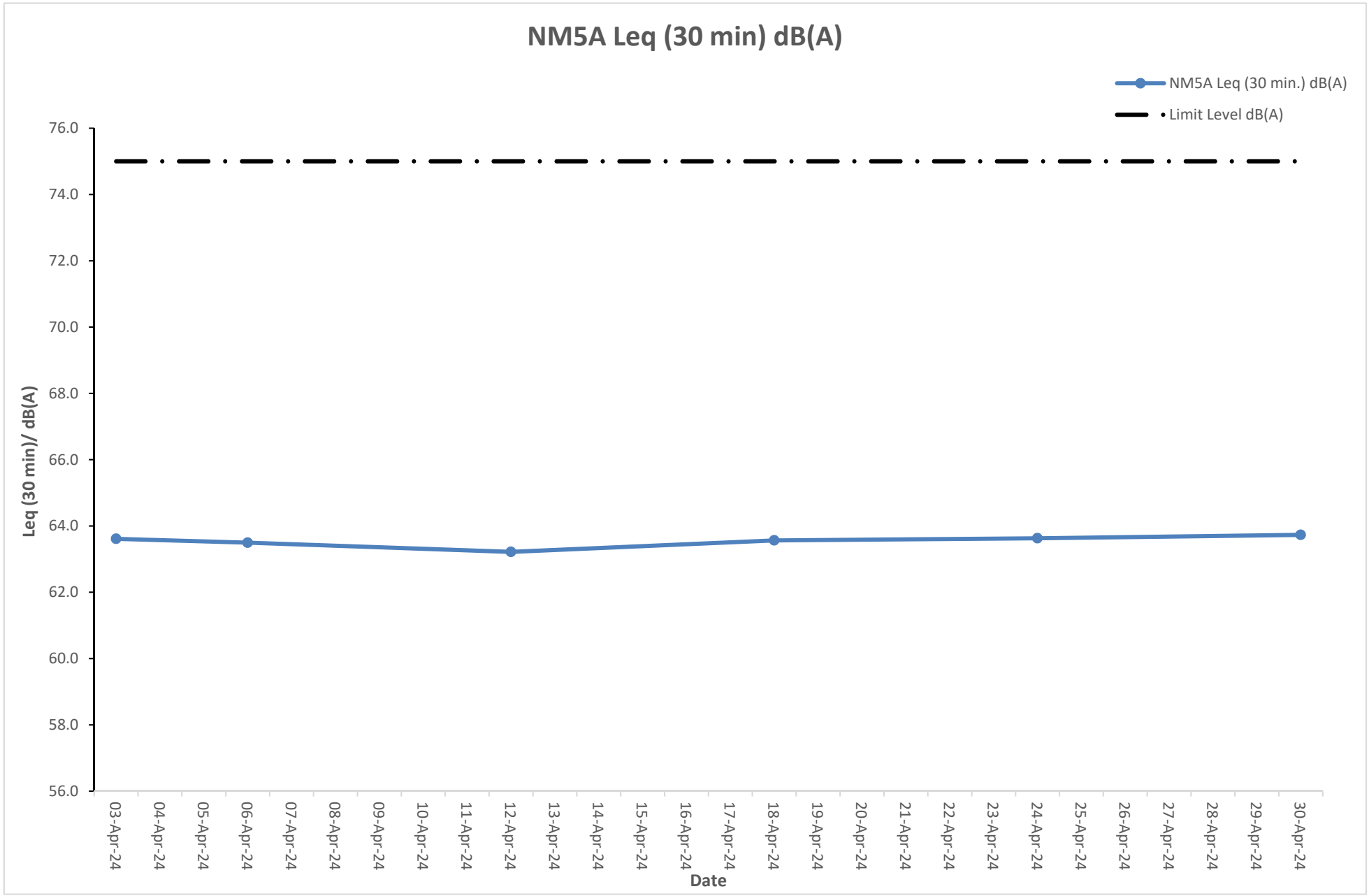
**Noise Monitoring Result at Station NM5A**

| Date | Time | Measured L10 dB(A) | Measured L90 dB(A) | Leq (30 min.) dB(A) | Leq (30 min.) +3 dB(A) |
|---|---|---|---|---|---|
| 03-Apr-24 | 15:27 | 62.5 | 59.0 | 60.6 | 63.6 |
| 03-Apr-24 | 15:32 | 61.5 | 58.0 | | |
| 03-Apr-24 | 15:37 | 62.5 | 57.4 | | |
| 03-Apr-24 | 15:42 | 62.8 | 58.2 | | |
| 03-Apr-24 | 15:47 | 62.4 | 57.4 | | |
| 03-Apr-24 | 15:52 | 61.6 | 59.1 | | |
| 06-Apr-24 | 9:31 | 62.0 | 58.1 | 60.5 | 63.5 |
| 06-Apr-24 | 9:36 | 62.6 | 58.2 | | |
| 06-Apr-24 | 9:41 | 62.4 | 57.8 | | |
| 06-Apr-24 | 9:46 | 62.7 | 58.4 | | |
| 06-Apr-24 | 9:51 | 62.5 | 57.7 | | |
| 06-Apr-24 | 9:56 | 61.4 | 59.0 | | |
| 12-Apr-24 | 15:25 | 61.4 | 58.3 | 60.2 | 63.2 |
| 12-Apr-24 | 15:30 | 61.9 | 58.9 | | |
| 12-Apr-24 | 15:35 | 62.6 | 58.4 | | |
| 12-Apr-24 | 15:40 | 62.0 | 59.1 | | |
| 12-Apr-24 | 15:45 | 62.3 | 59.3 | | |
| 12-Apr-24 | 15:50 | 62.8 | 58.2 | | |
| 18-Apr-24 | 9:22 | 62.1 | 57.9 | 60.6 | 63.6 |
| 18-Apr-24 | 9:27 | 62.3 | 58.0 | | |
| 18-Apr-24 | 9:32 | 61.8 | 58.0 | | |
| 18-Apr-24 | 9:37 | 61.7 | 57.8 | | |
| 18-Apr-24 | 9:42 | 61.4 | 58.5 | | |
| 18-Apr-24 | 9:47 | 62.8 | 58.0 | | |
| 24-Apr-24 | 15:22 | 61.7 | 58.7 | 60.6 | 63.6 |
| 24-Apr-24 | 15:27 | 62.6 | 58.4 | | |
| 24-Apr-24 | 15:32 | 61.4 | 58.8 | | |
| 24-Apr-24 | 15:37 | 62.1 | 58.1 | | |
| 24-Apr-24 | 15:42 | 62.5 | 58.2 | | |
| 24-Apr-24 | 15:47 | 61.4 | 57.9 | | |
| 30-Apr-24 | 9:33 | 61.9 | 59.2 | 60.7 | 63.7 |
| 30-Apr-24 | 9:38 | 62.1 | 58.0 | | |
| 30-Apr-24 | 9:43 | 62.1 | 57.7 | | |
| 30-Apr-24 | 9:48 | 61.5 | 58.9 | | |
| 30-Apr-24 | 9:53 | 62.5 | 57.4 | | |
| 30-Apr-24 | 9:58 | 62.0 | 58.1 | | |

**Remarks:**
+3dB(A) correction was applied to free-field measurement.

The station set-up of a free-field measurement at station NM5A.

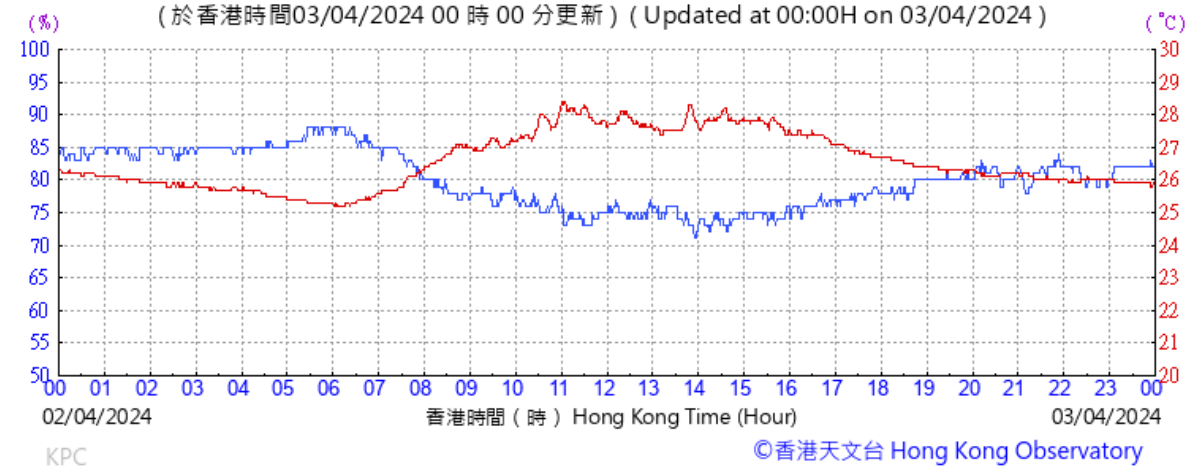
**Graphical Presentation of Noise Monitoring Result at Station NM5A**



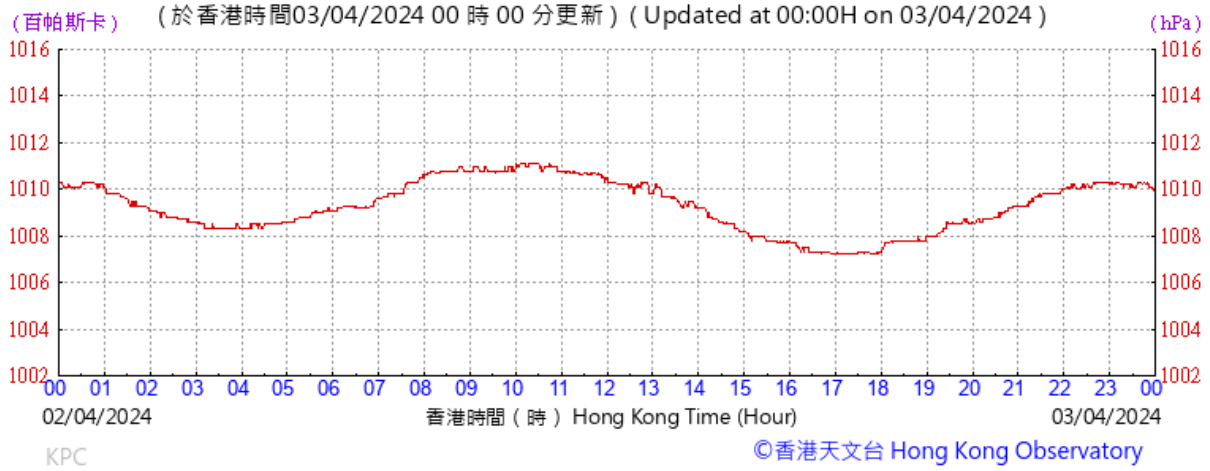
# H. Meteorological Data Extracted from Hong Kong Observatory

## Extract of Meteorological Observations for King's Park Automatic Weather Station, April, 2024

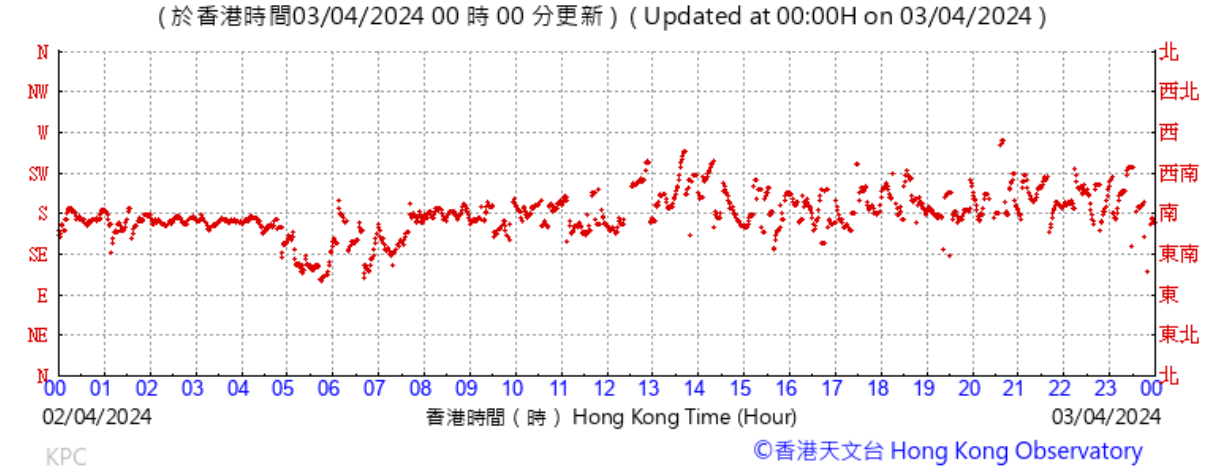
Tempearture/Humidity:



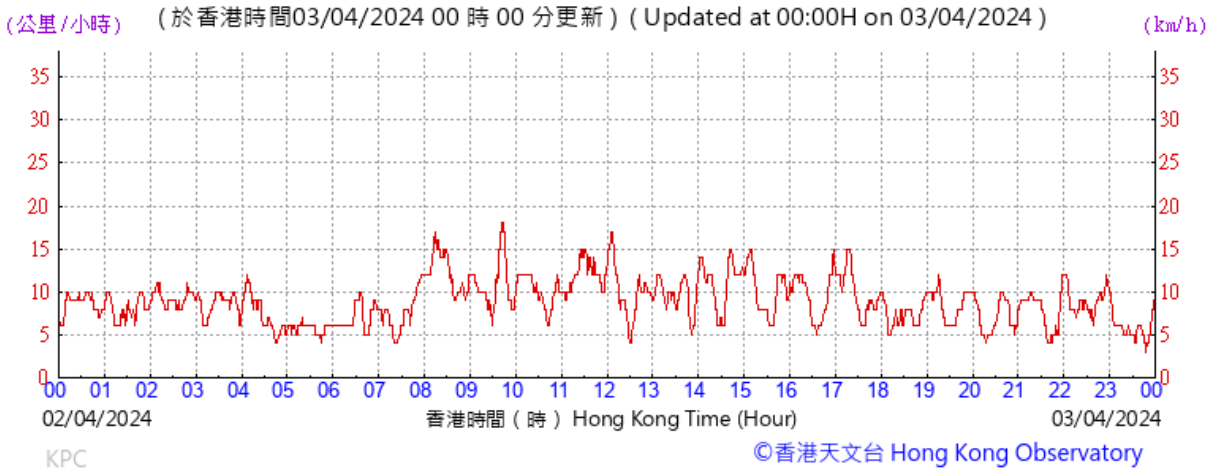

Pressure:



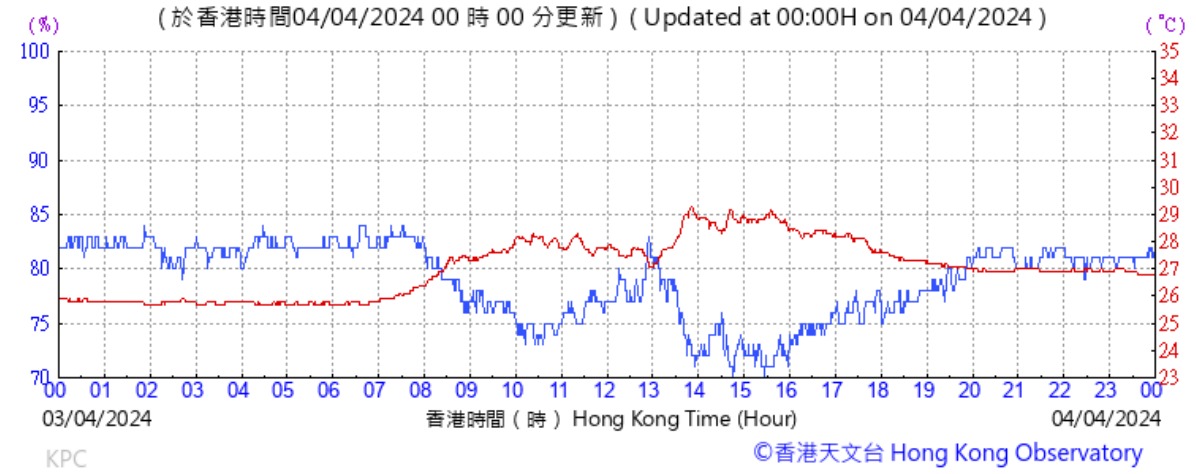

Wind Direction:



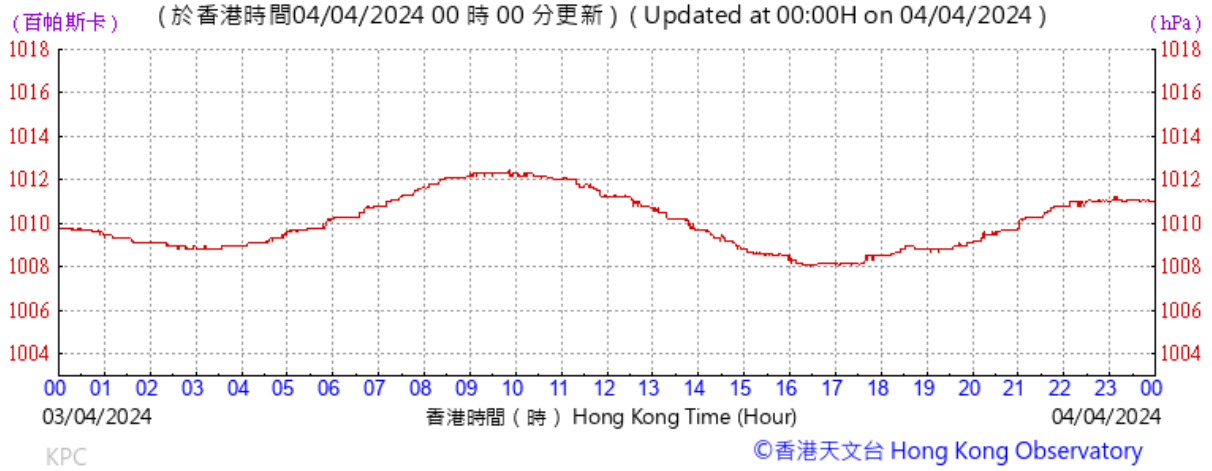

Wind Speed:



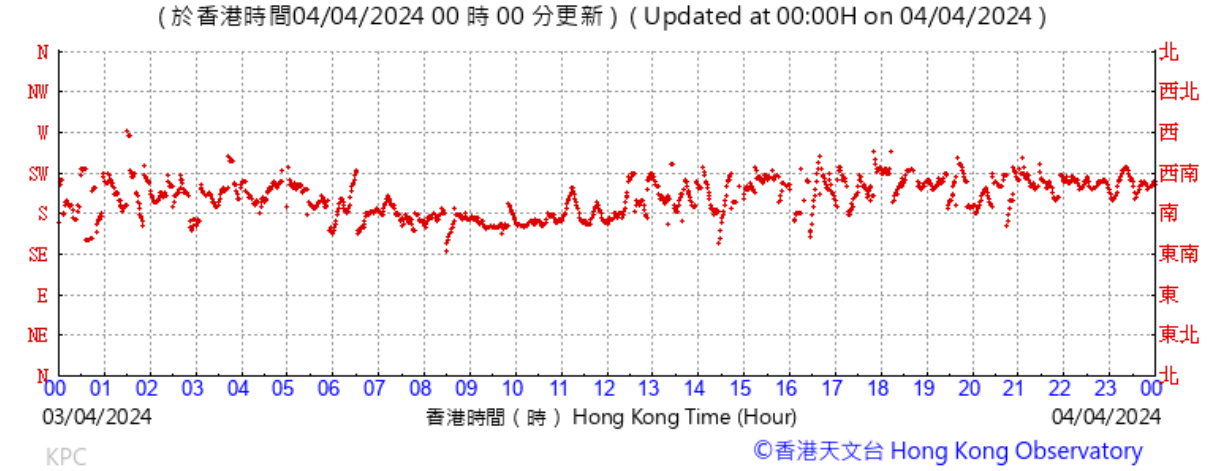
Tempearture/Humidity:



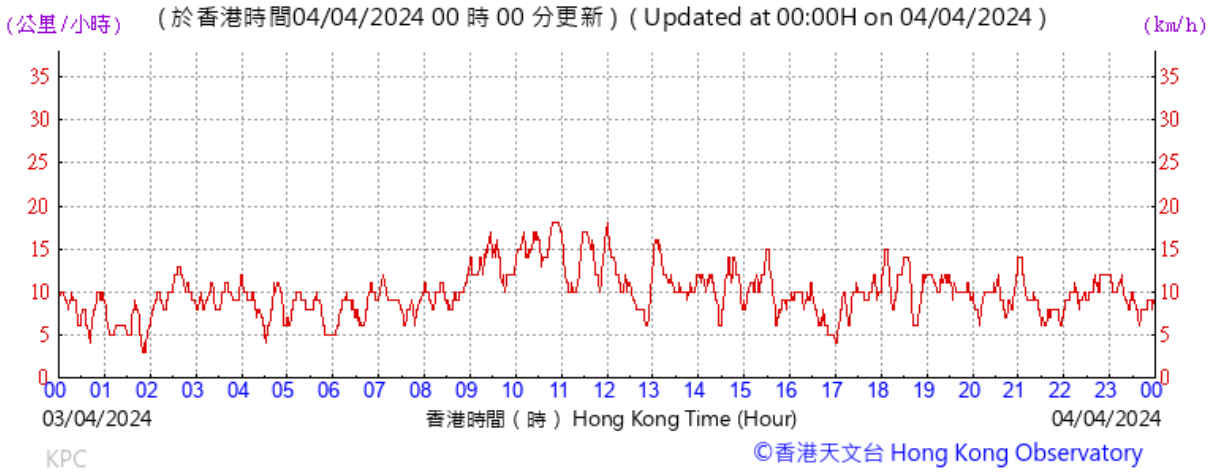

Pressure:



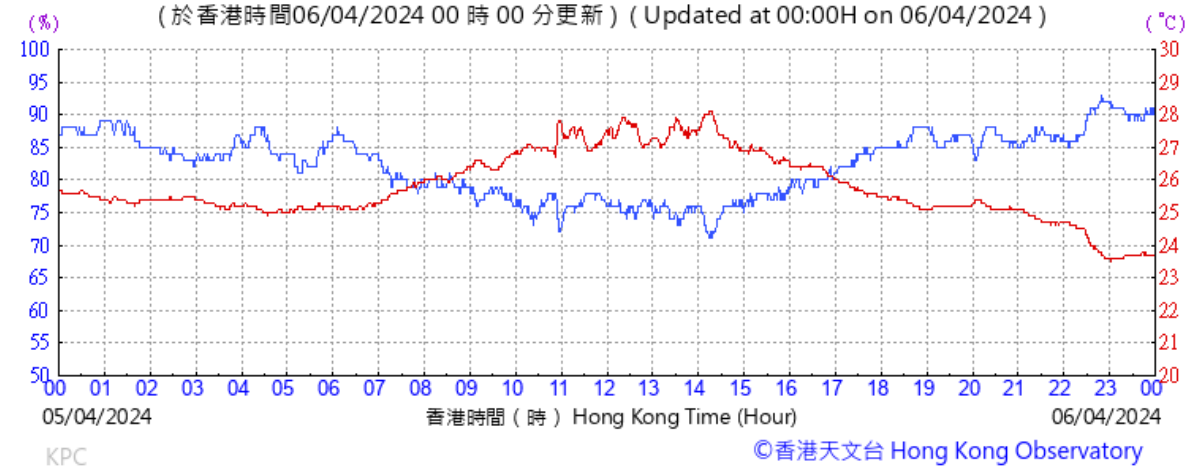

Wind Direction:



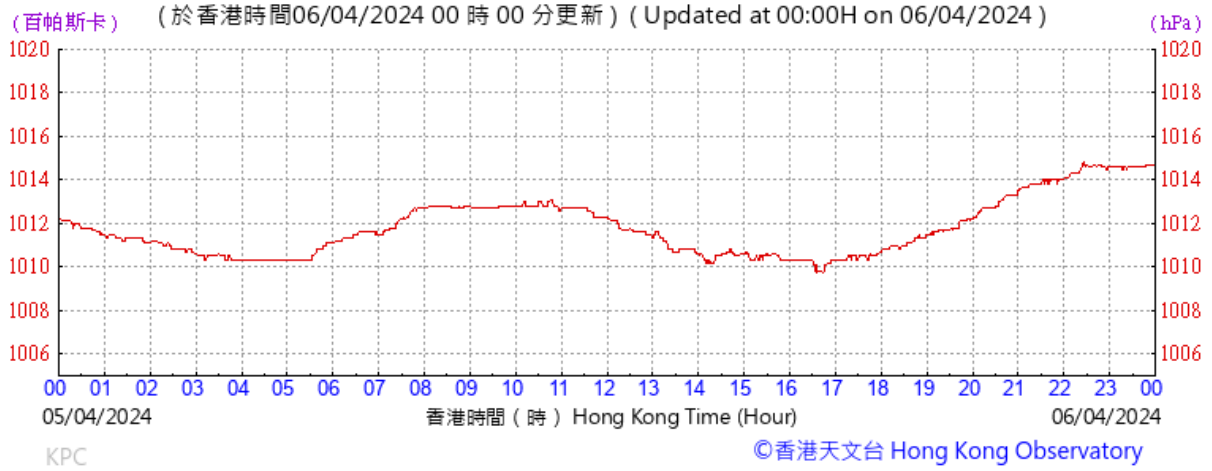

Wind Speed:



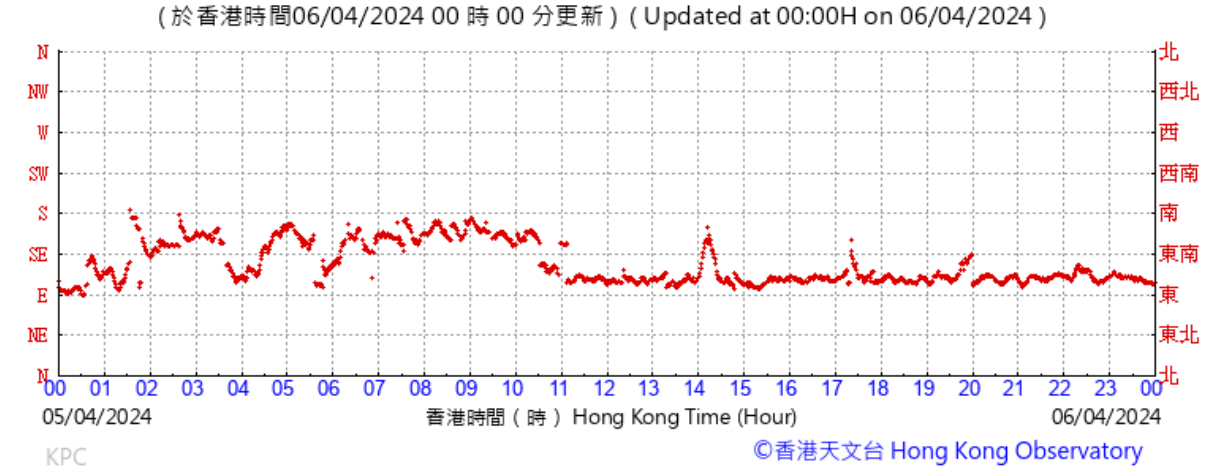
Tempearture/Humidity:



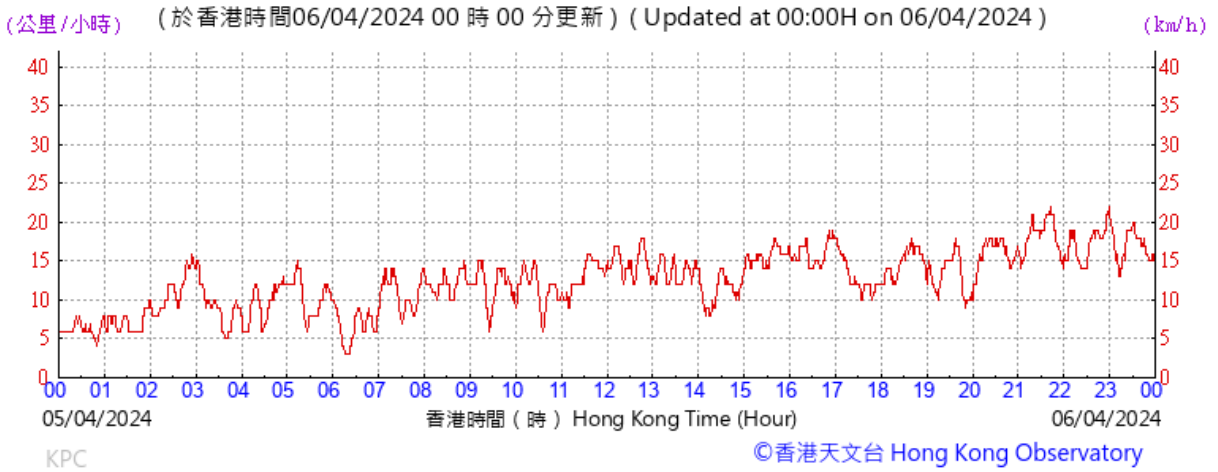

Pressure:



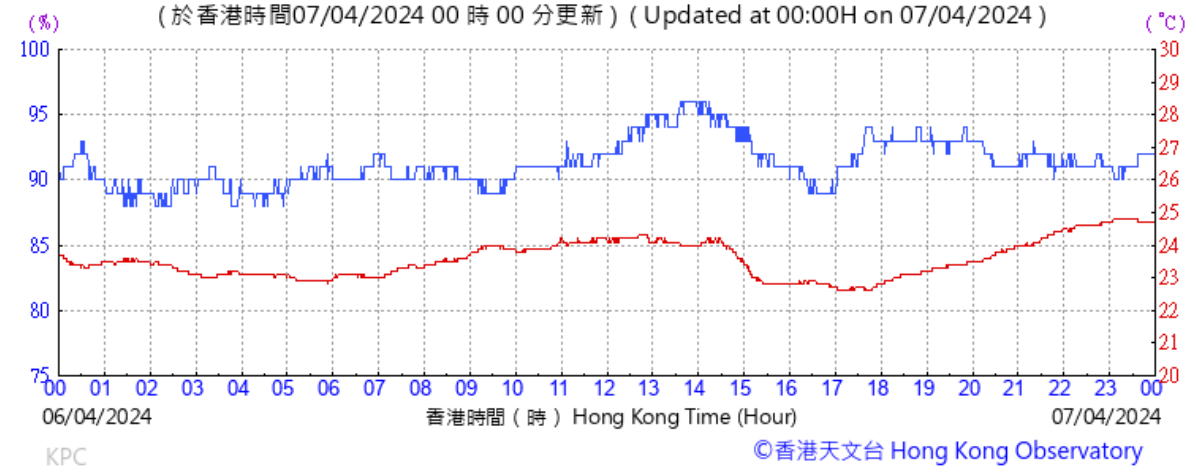

Wind Direction:



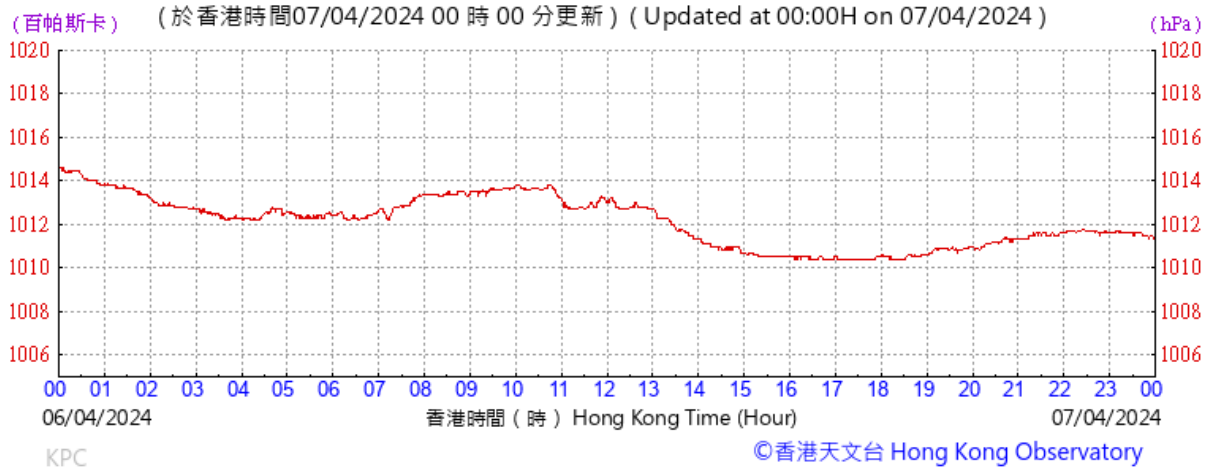

Wind Speed:



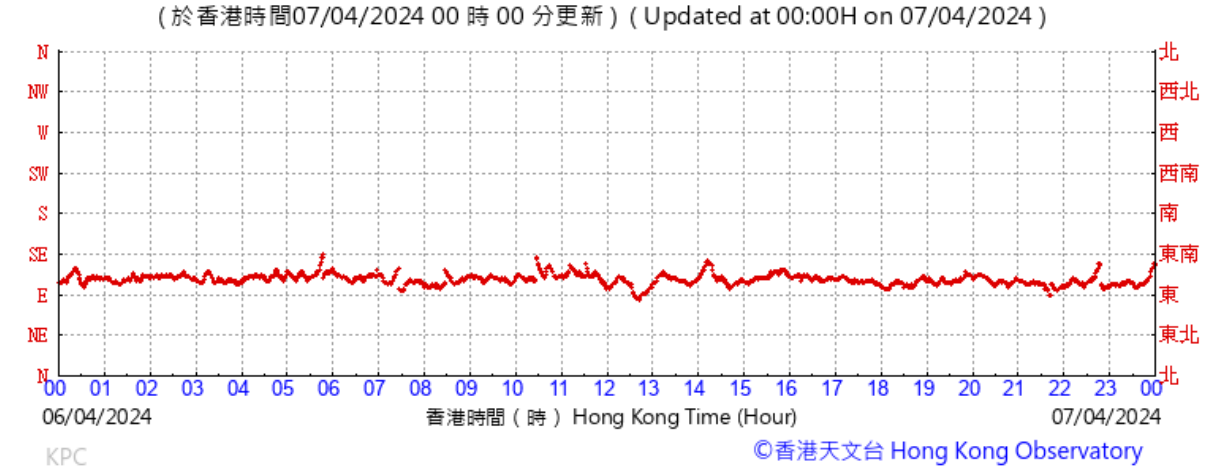
Tempearture/Humidity:



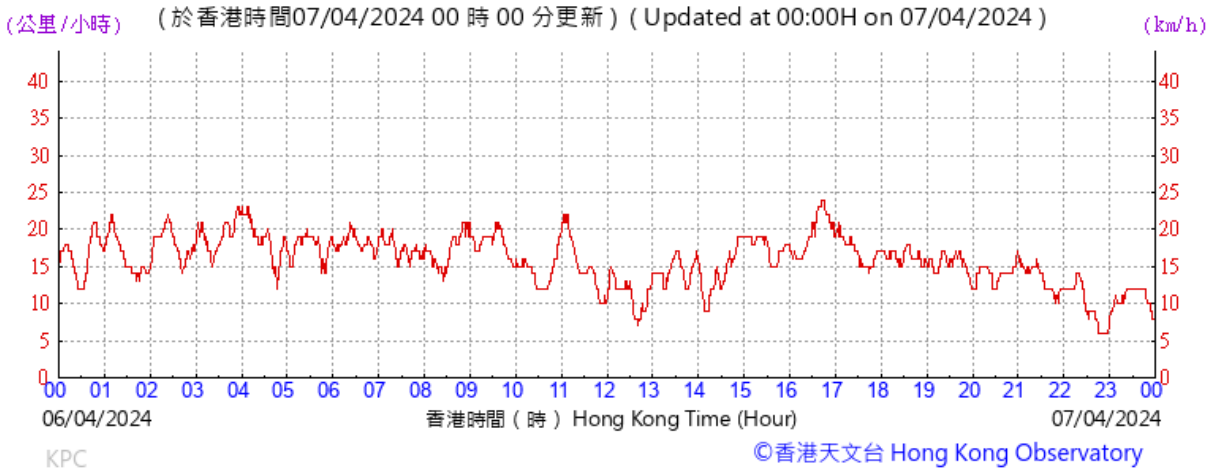

Pressure:



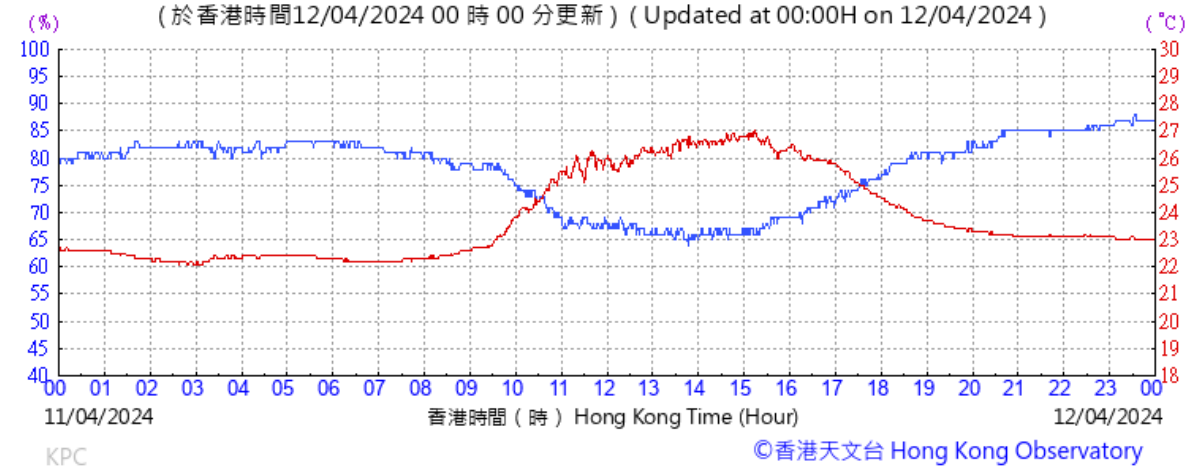

Wind Direction:



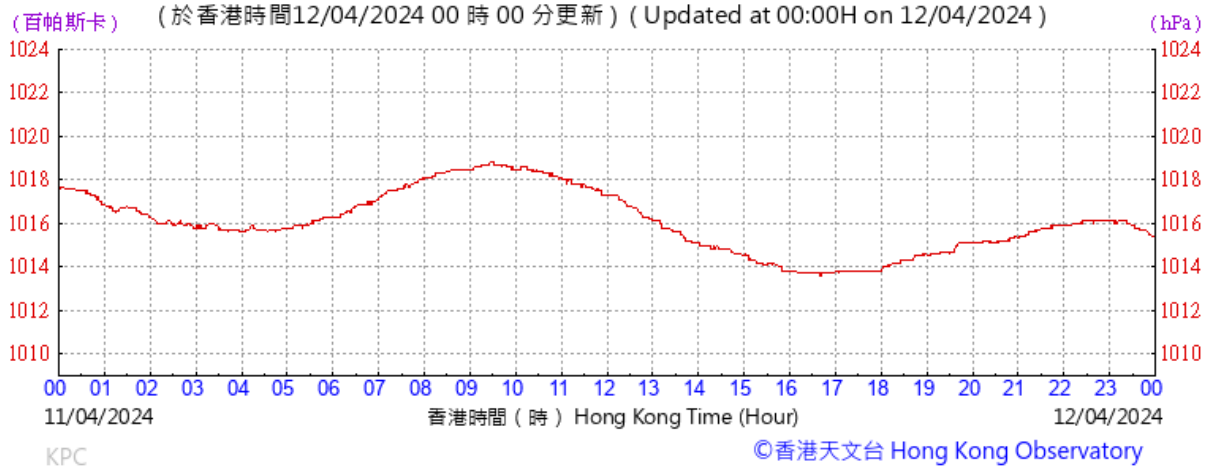

Wind Speed:



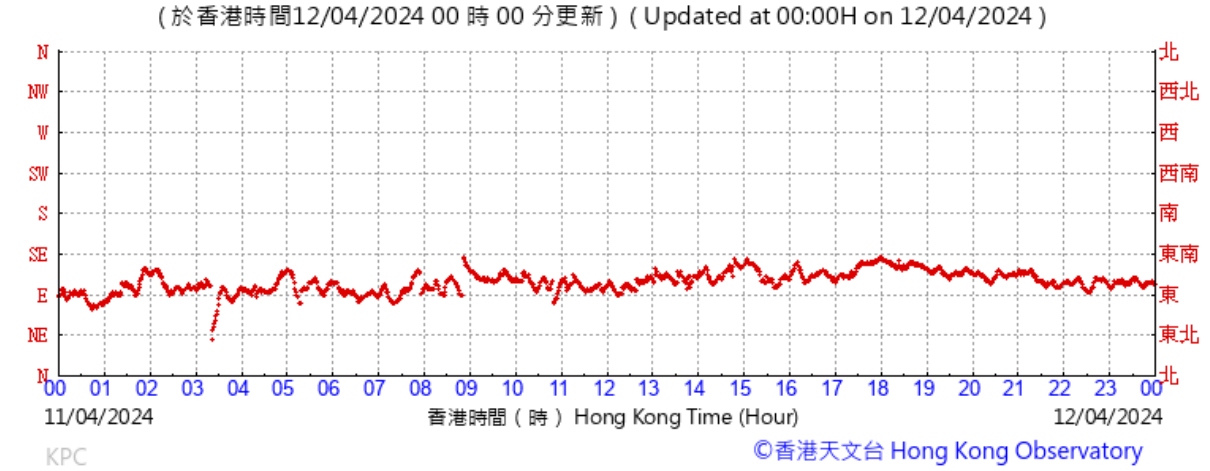
Tempearture/Humidity:



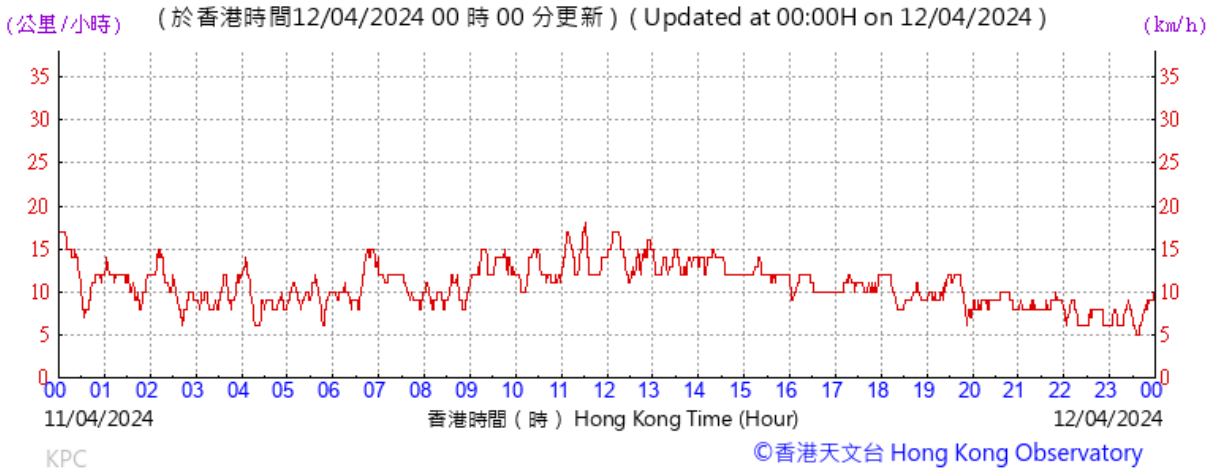

Pressure:



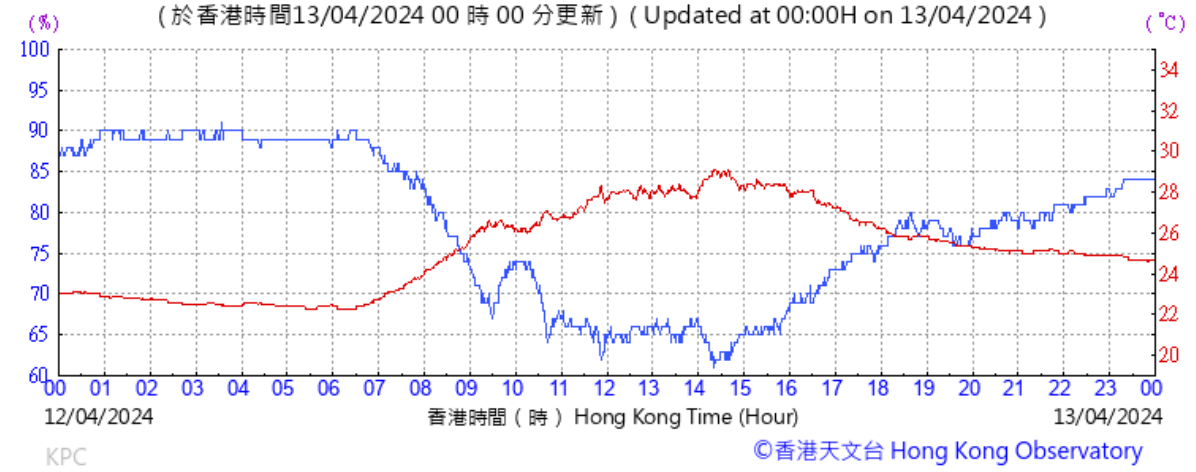

Wind Direction:



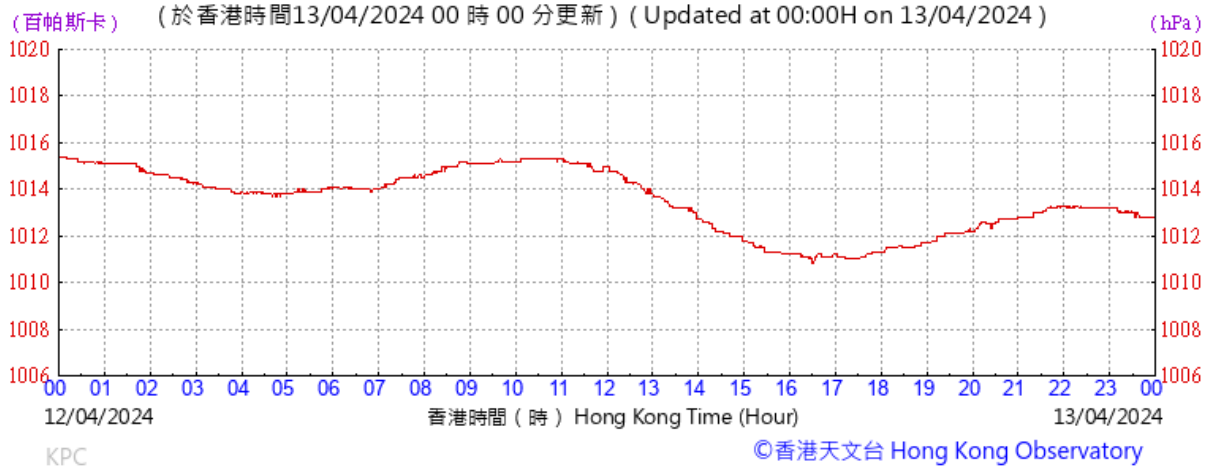

Wind Speed:



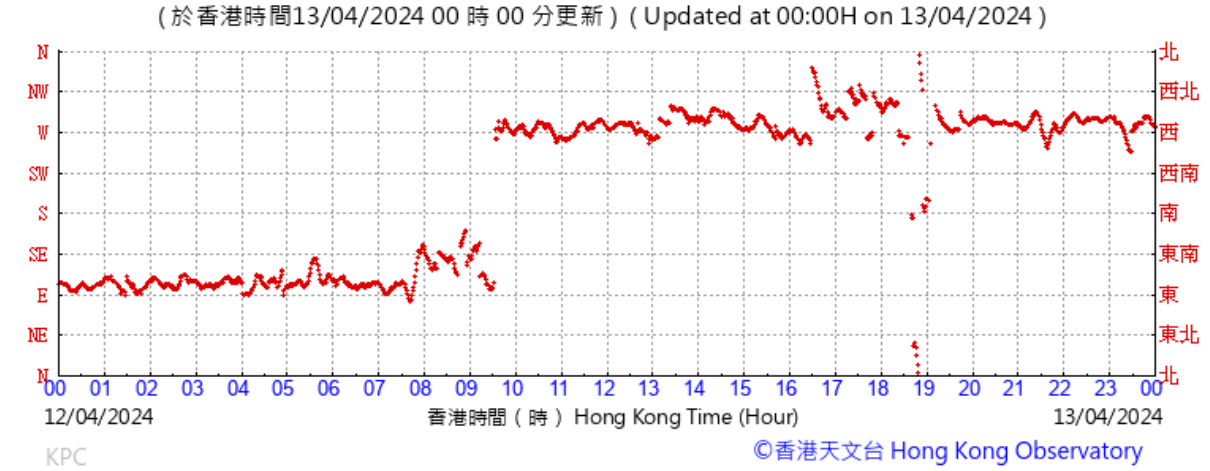
Tempearture/Humidity:




Pressure:

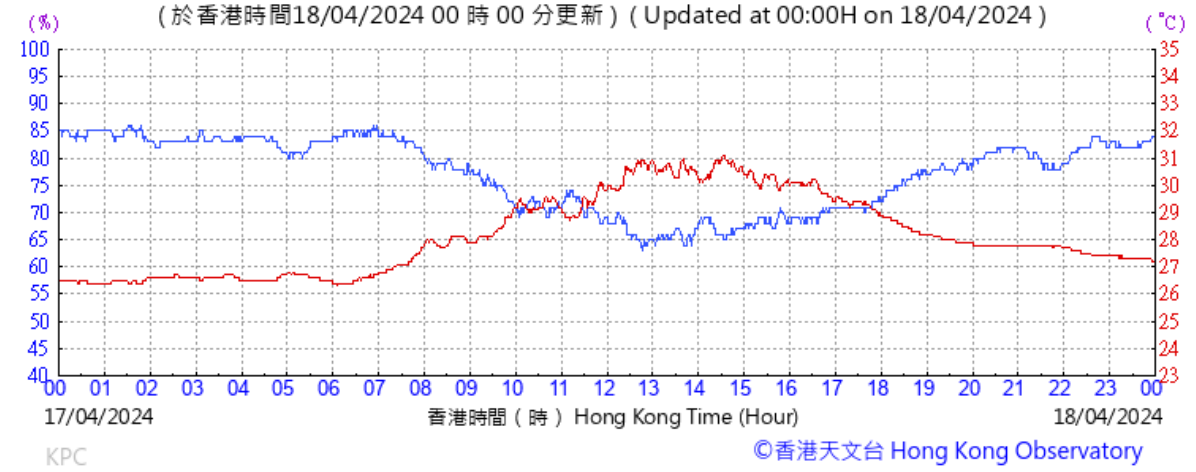



Wind Direction:

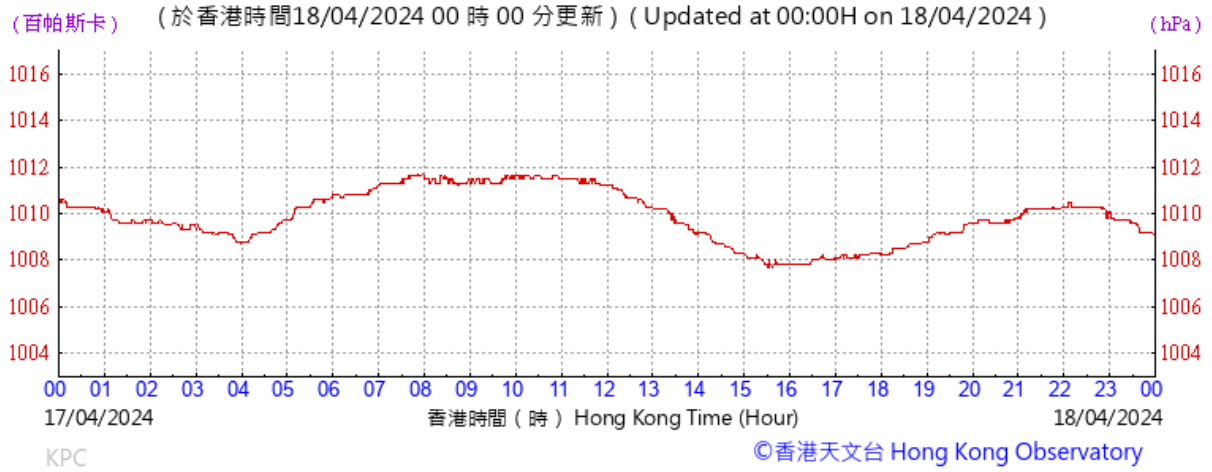



Wind Speed:

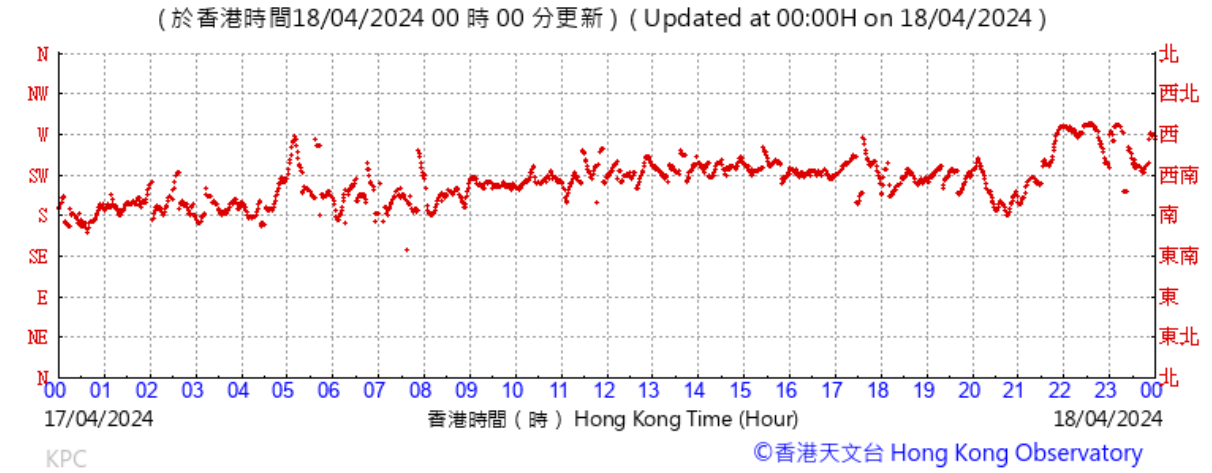
Tempearture/Humidity:



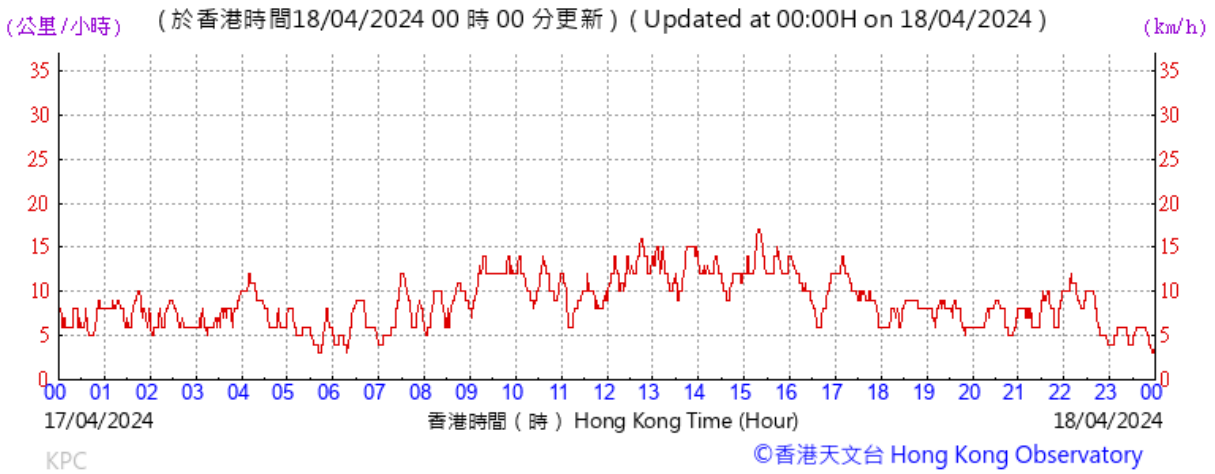

Pressure:



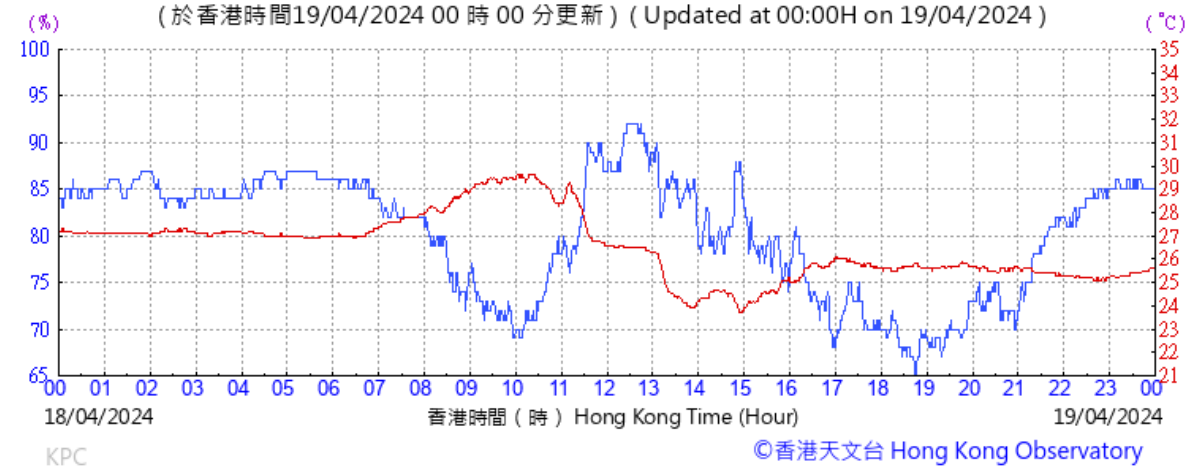

Wind Direction:



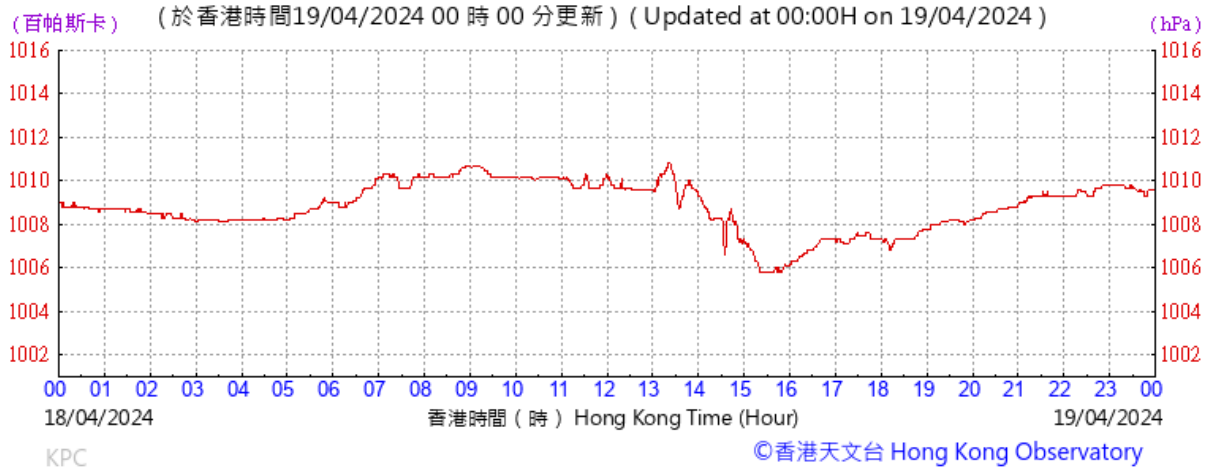

Wind Speed:



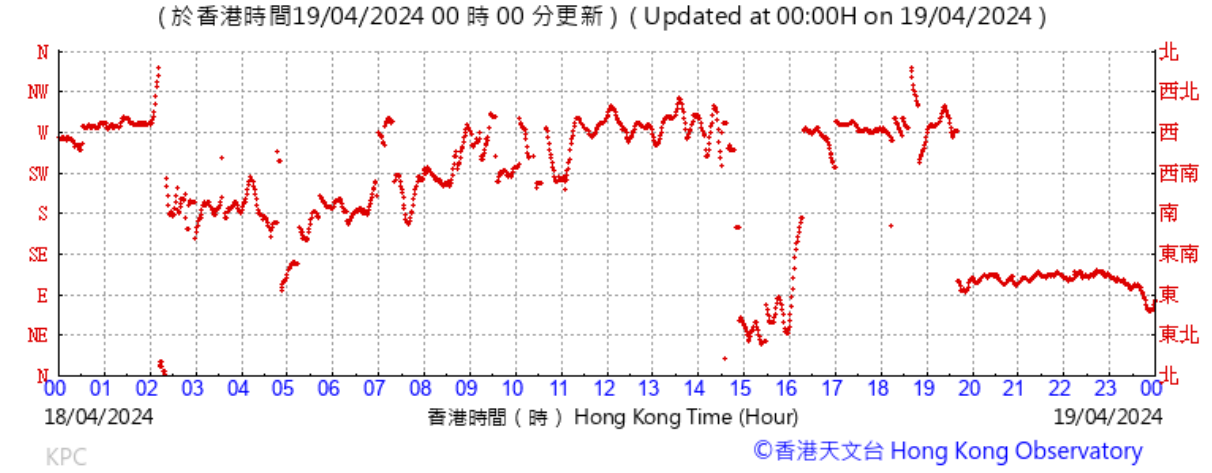
Tempearture/Humidity:



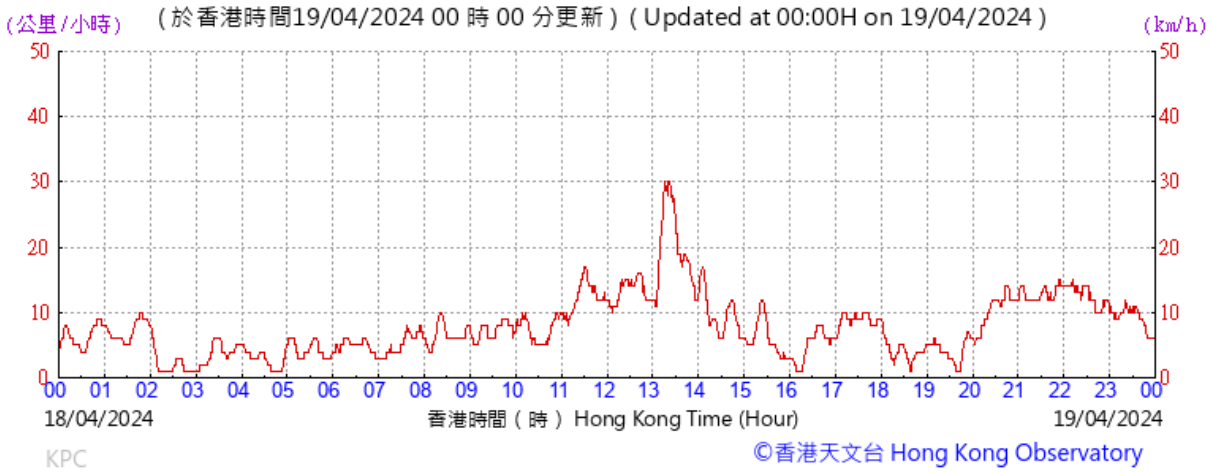

Pressure:



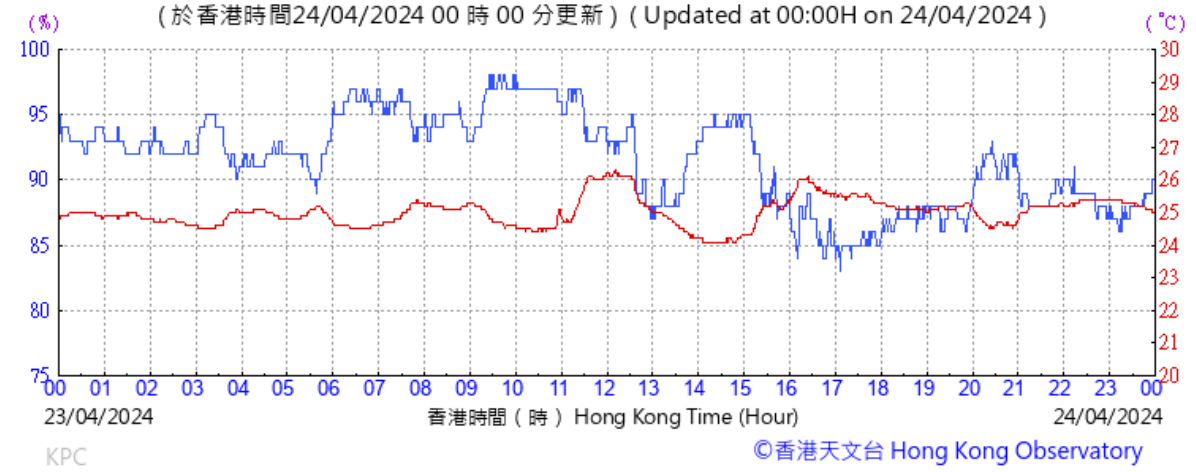

Wind Direction:



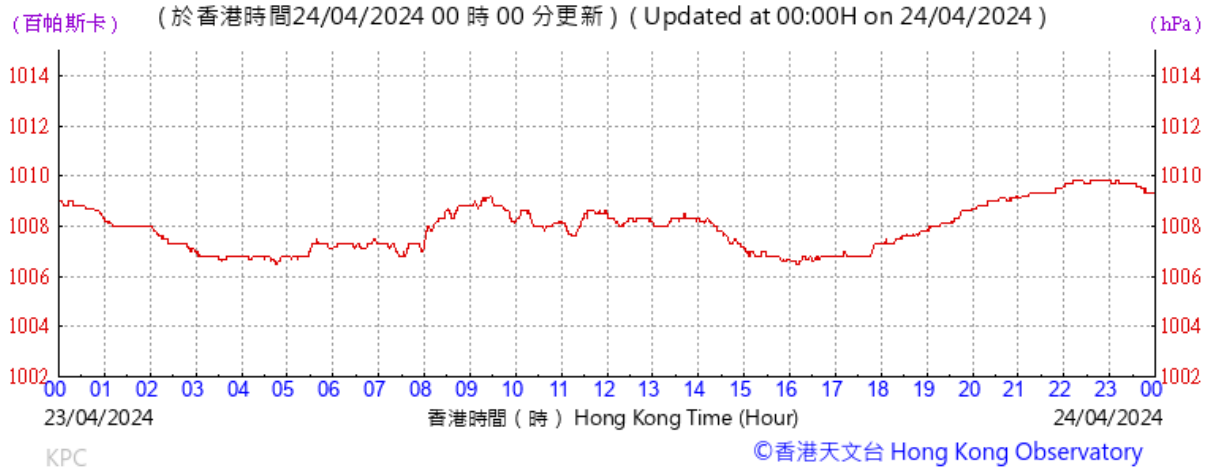

Wind Speed:



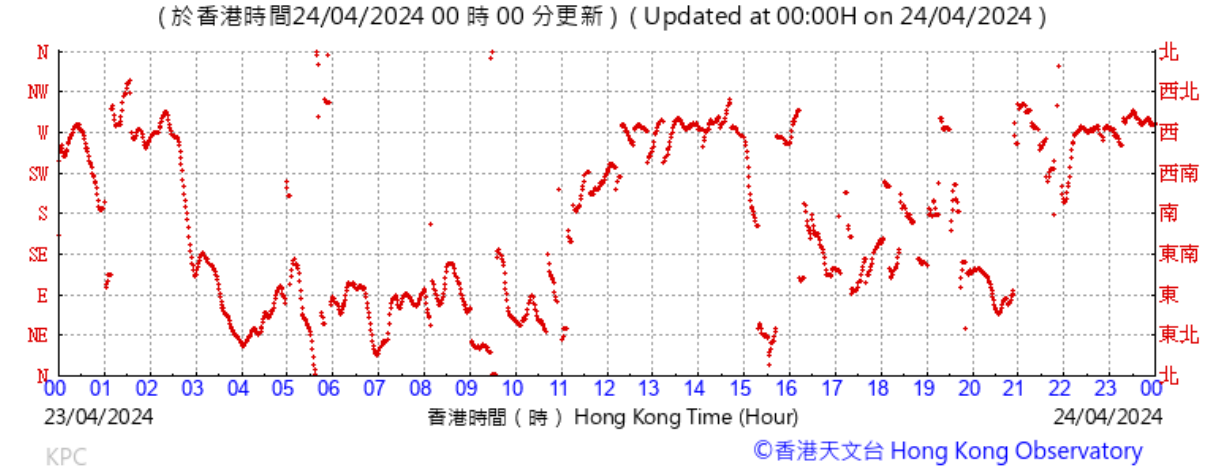
Tempearture/Humidity:




Pressure:

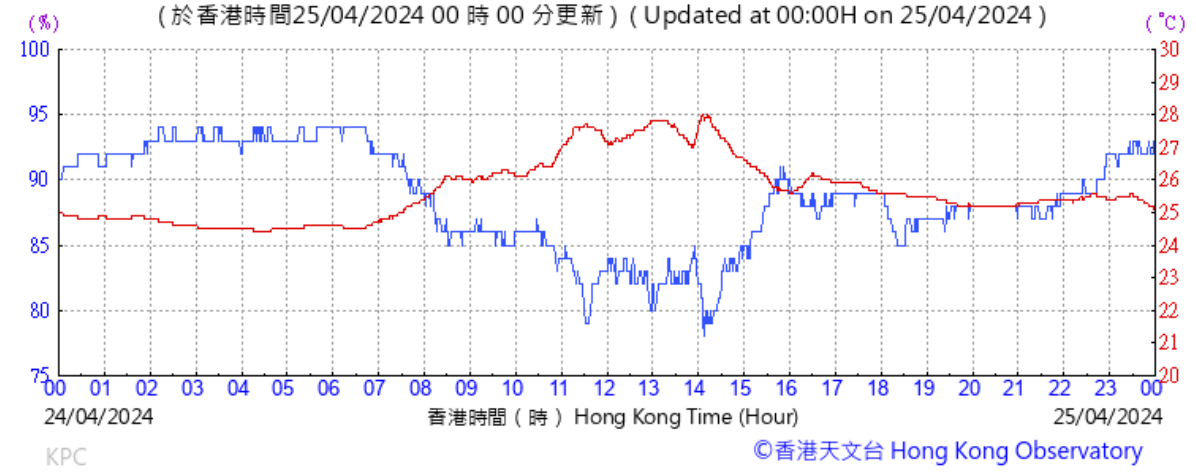



Wind Direction:

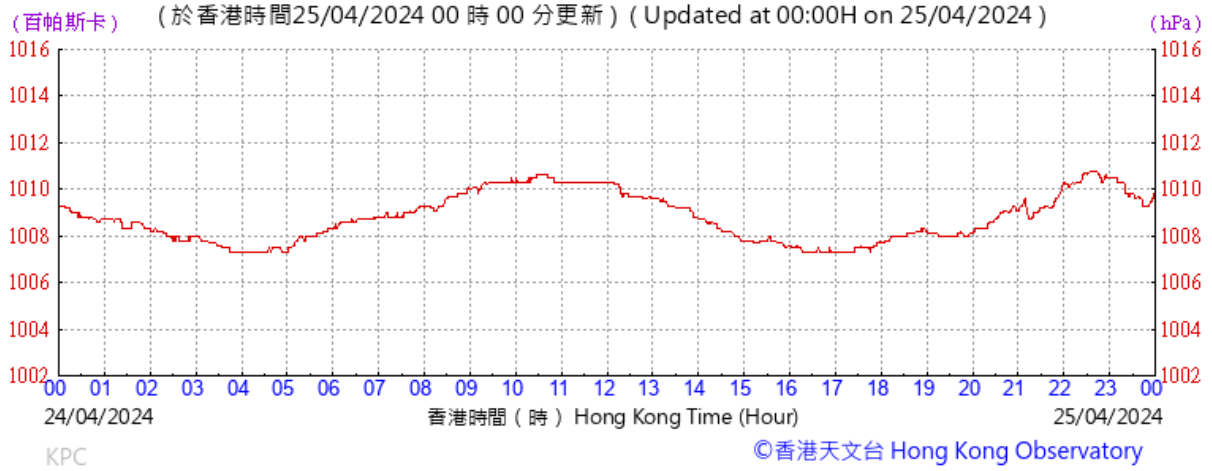



Wind Speed:

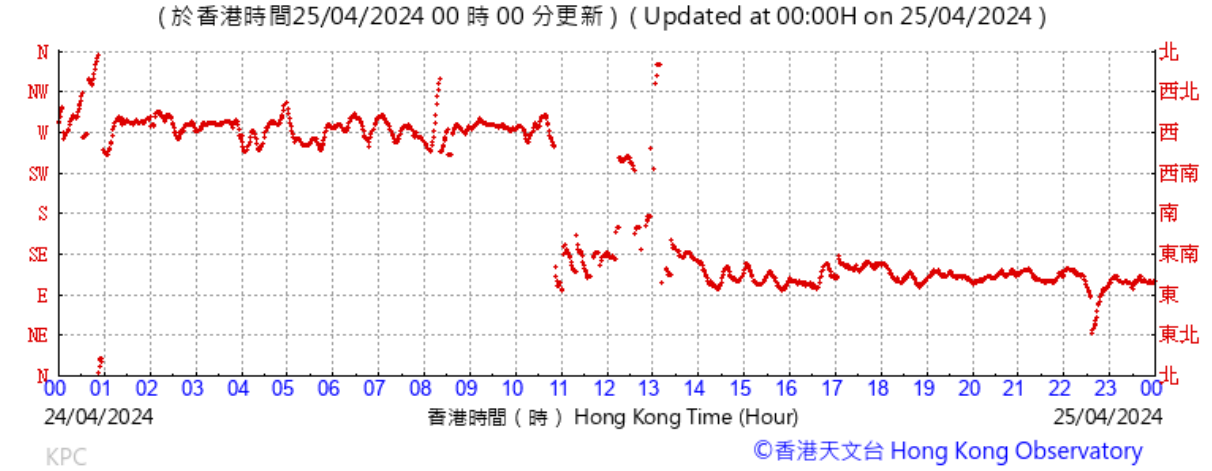
Tempearture/Humidity:



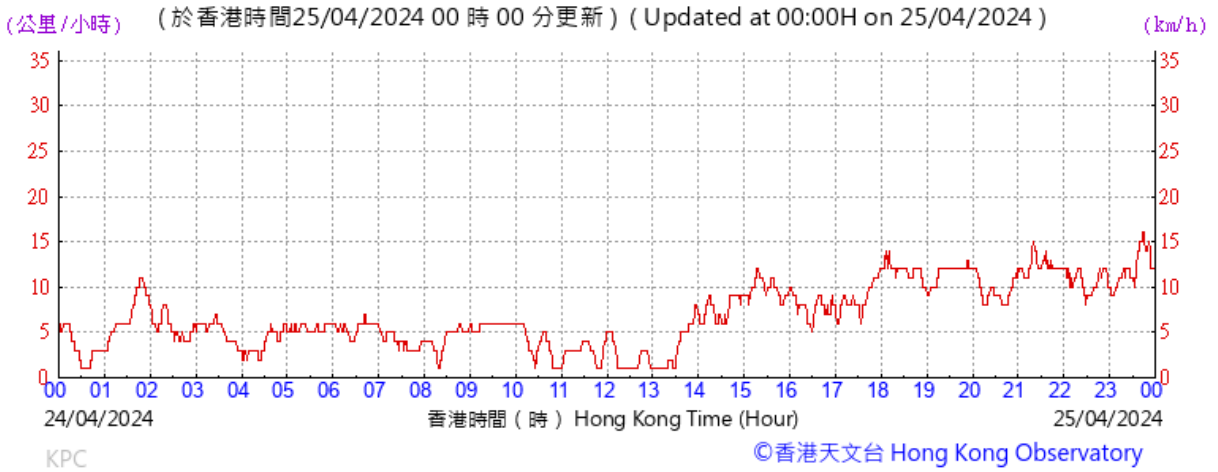

Pressure:



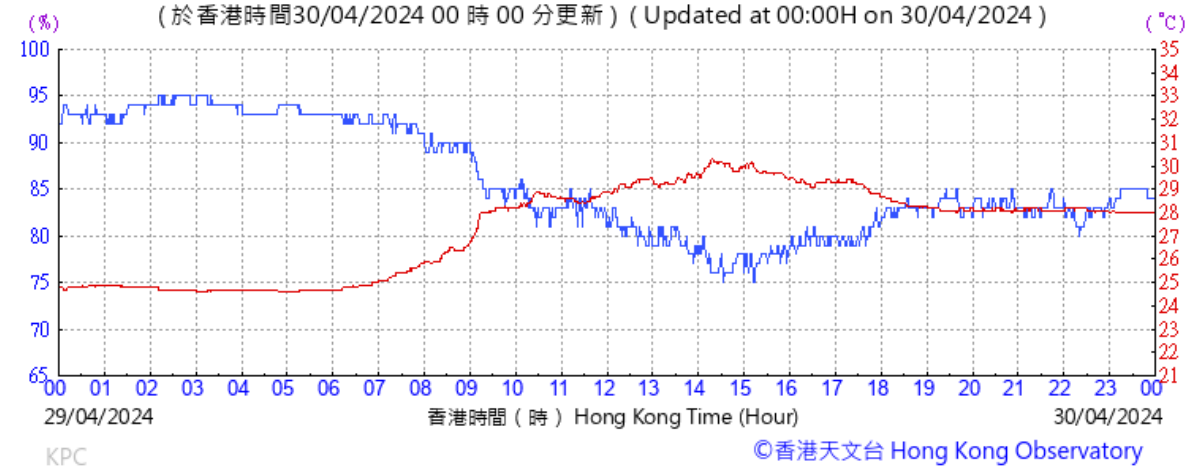

Wind Direction:



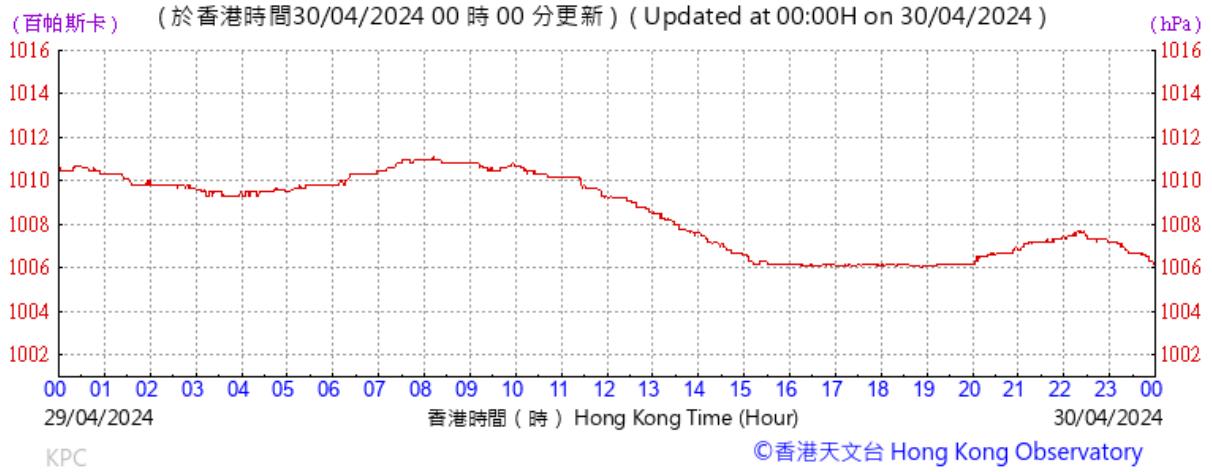

Wind Speed:



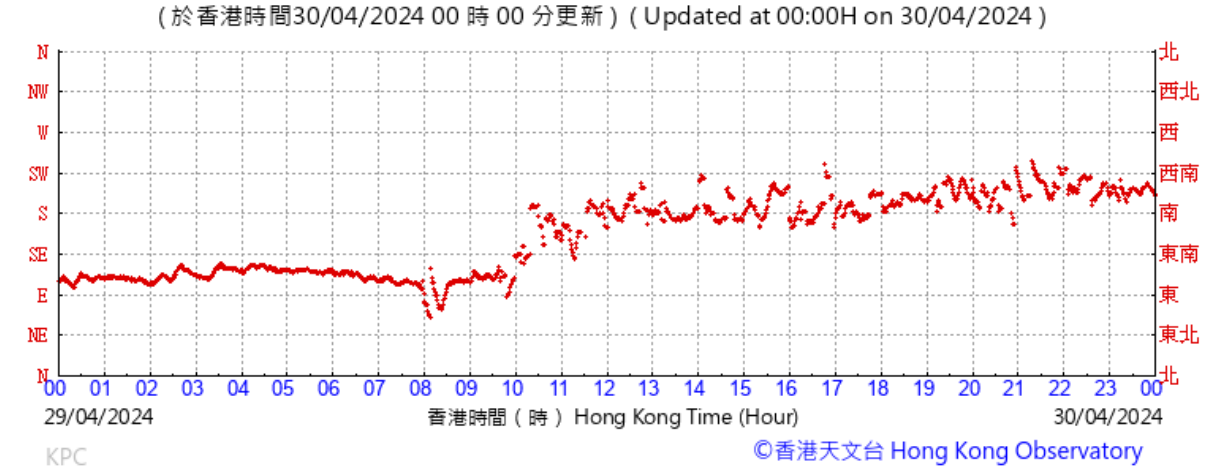
Tempearture/Humidity:



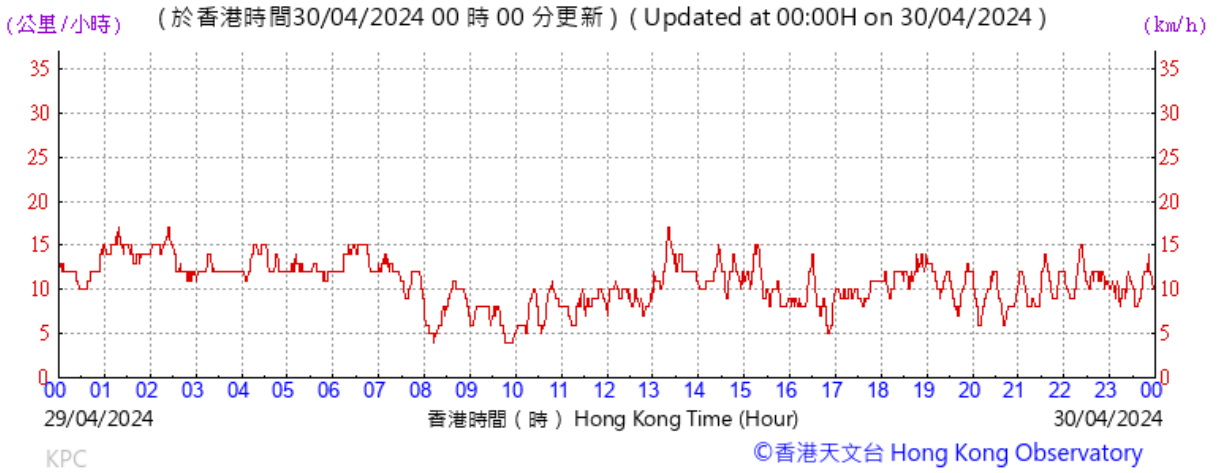

Pressure:



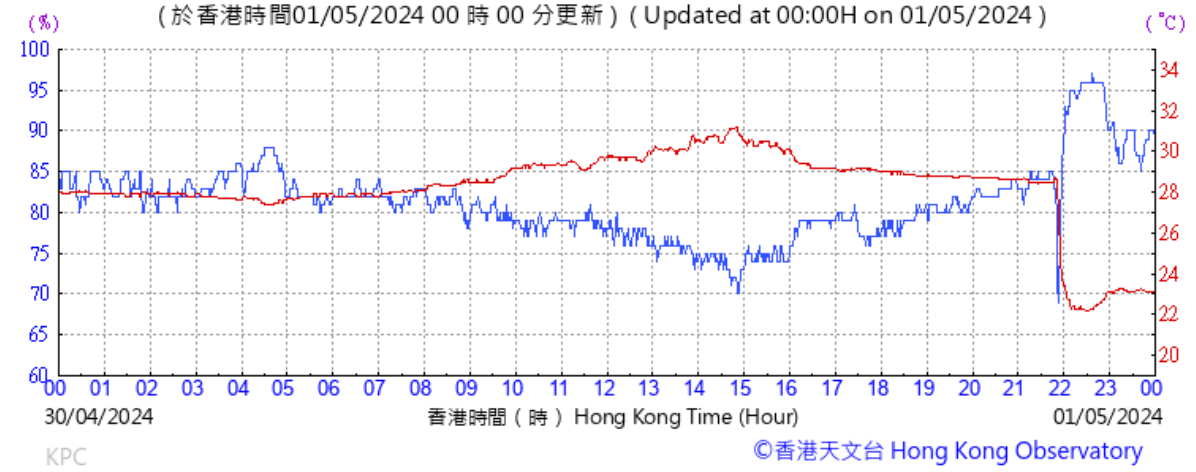

Wind Direction:



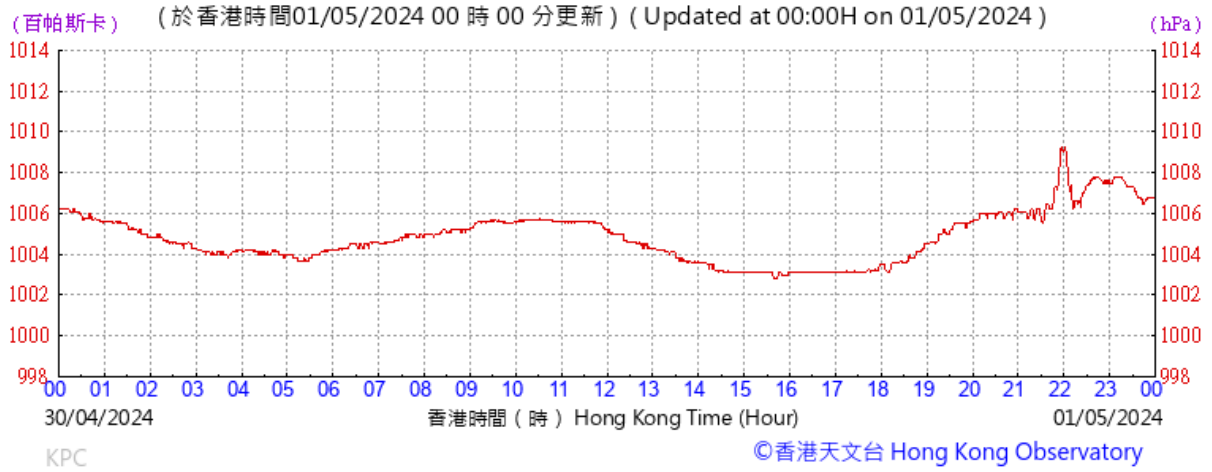

Wind Speed:



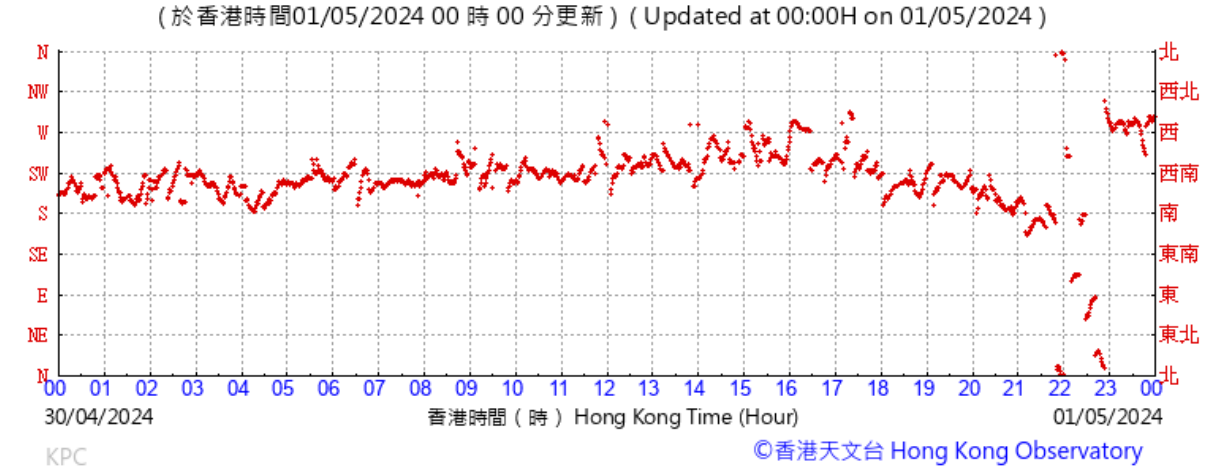
Tempearture/Humidity:



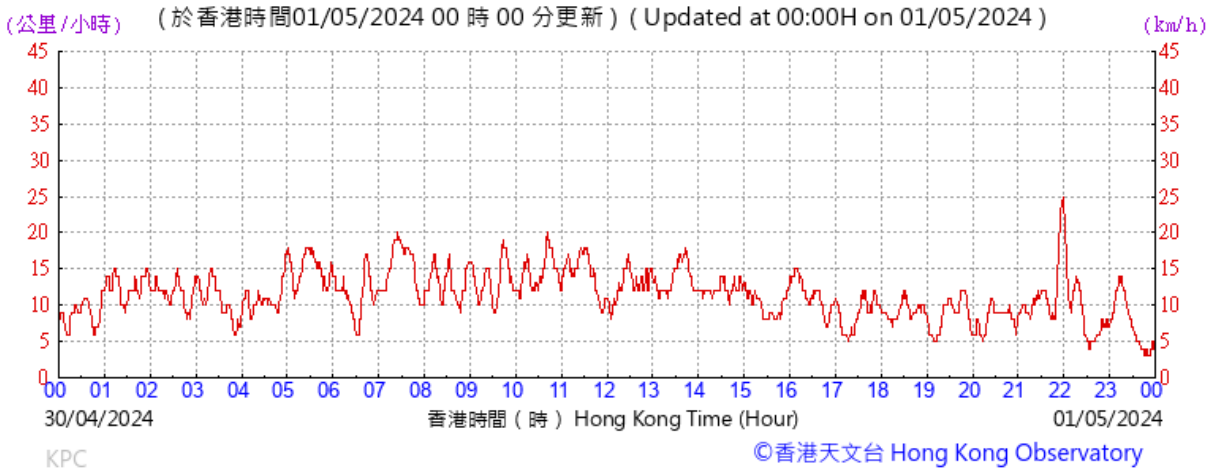

Pressure:




Wind Direction:




Wind Speed:



# I. Waste Flow table

# Zone 2B & 2C

**Table I-1: Monthly Waste Flow Table for Zone 2B & 2C**

| Month | Actual Quantities of Inert C&D Materials Generated Monthly | | | | | | | Actual Quantities of C&D Materials Generated Monthly | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Quantity Generated | Hard Rocks and Large Broken Concrete | Reused in the Contract | Reused in other Projects | Disposed as Public Fill | Disposed to Sroting Facility | Imported Fill | Metals | Paper/ Cardboard Packaging | Plastics | Wood/ Timber | Chemical Waste | Others, e.g. General Refuse |
| | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) | (in tonnes) |
| **2021** | | | | | | | | | | | | | |
| Sep | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Oct | 22.58 | 22.58 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 13.19 |
| Nov | 9265.04 | 10.45 | 125.93 | 0.00 | 9128.66 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 17.12 |
| Dec | 13462.30 | 62.94 | 1041.17 | 0.00 | 12358.19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 13.62 |
| Sub-total (2021) | 22749.92 | 95.97 | 1167.10 | 0.00 | 21486.85 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 43.93 |
| **2022** | | | | | | | | | | | | | |
| Jan | 17427.64 | 0.00 | 2091.32 | 100.04 | 15236.28 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 7.60 |
| Feb | 18230.98 | 0.00 | 991.53 | 1719.99 | 15519.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 6.90 |
| Mar | 24777.12 | 0.00 | 2176.32 | 11721.21 | 10879.59 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.40 | 16.15 |
| Apr | 32749.58 | 0.00 | 2409.00 | 22393.87 | 7946.71 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 16.79 |
| May | 31115.05 | 0.00 | 3141.32 | 15121.57 | 12852.16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 13.31 |
| Jun | 30747.96 | 0.00 | 3120.62 | 14645.87 | 12981.47 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 15.84 |
| Jul | 34017.48 | 0.00 | 3444.43 | 10214.91 | 20358.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 17.43 |
| Aug | 38065.92 | 0.00 | 3272.46 | 3610.61 | 31182.85 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 29.99 |
| Sep | 38896.62 | 0.00 | 3664.45 | 2790.24 | 32441.93 | 0.00 | 0.00 | 15.80 | 0.00 | 0.00 | 0.00 | 0.00 | 29.88 |
| Oct | 41174.38 | 0.00 | 4340.02 | 2447.22 | 34387.14 | 0.00 | 0.00 | 86.63 | 0.00 | 0.00 | 0.00 | 0.00 | 28.50 |
| Nov | 40031.63 | 0.00 | 4149.91 | 1021.06 | 34860.66 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 36.54 |
| Dec | 42615.90 | 0.00 | 4242.02 | 1655.36 | 36718.52 | 0.00 | 0.00 | 10.23 | 0.00 | 0.00 | 0.00 | 0.00 | 36.04 |
| Sub-total (2022) | 389850.25 | 0.00 | 37043.39 | 87441.95 | 265364.91 | 0.00 | 0.00 | 112.66 | 0.00 | 0.00 | 0.00 | 1.40 | 254.97 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2023** | | | | | | | | | | | | | |
| Jan | 35248.24 | 0.00 | 2711.85 | 1182.55 | 31353.84 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 22.92 |
| Feb | 39553.32 | 0.00 | 4737.76 | 3184.34 | 31631.22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.40 | 35.95 |
| Mar | 42528.10 | 0.00 | 4710.97 | 2381.39 | 35435.74 | 0.00 | 0.00 | 24.21 | 0.00 | 0.00 | 0.00 | 1.80 | 36.38 |
| Apr | 29352.63 | 0.00 | 3136.52 | 1211.00 | 25005.11 | 0.00 | 0.00 | 23.79 | 0.00 | 0.00 | 0.00 | 1.60 | 33.30 |
| May | 33842.57 | 0.00 | 3742.02 | 1113.13 | 28987.42 | 0.00 | 0.00 | 33.86 | 0.00 | 0.00 | 0.00 | 0.00 | 34.16 |
| Jun | 26638.62 | 0.00 | 3926.07 | 708.34 | 22004.21 | 0.00 | 0.00 | 90.36 | 0.00 | 0.00 | 0.00 | 0.40 | 40.29 |
| Jul | 16946.46 | 0.00 | 2228.35 | 30.63 | 14687.48 | 0.00 | 0.00 | 23.77 | 0.00 | 0.00 | 0.00 | 1.20 | 53.51 |
| Aug | 14143.71 | 0.00 | 2356.05 | 76.03 | 11711.63 | 0.00 | 0.00 | 14.84 | 0.00 | 0.00 | 0.00 | 1.40 | 44.35 |
| Sep | 7142.10 | 0.00 | 1423.05 | 0.00 | 5719.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.20 |
| Oct | 2847.84 | 0.00 | 0.00 | 0.00 | 2833.79 | 14.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 27.58 |
| Nov | 4052.81 | 0.00 | 0.00 | 0.00 | 4052.81 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 42.50 |
| Dec | 3119.02 | 0.00 | 0.00 | 0.00 | 3119.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 21.77 |
| Sub-total (2023) | 255415.42 | 0.00 | 28972.64 | 9887.41 | 216541.32 | 14.05 | 0.00 | 210.83 | 0.00 | 0.00 | 0.00 | 7.80 | 417.91 |
| **2024** | | | | | | | | | | | | | |
| Jan | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 8.79 |
| Feb | 18.34 | 0.00 | 0.00 | 0.00 | 18.34 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 14.43 |
| Mar | 1836.65 | 0.00 | 0.00 | 0.00 | 1836.65 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 9.97 |
| Apr | 409.66 | 0.00 | 0.00 | 0.00 | 409.66 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 22.61 |
| Sub-total (2024) | 2264.65 | 0.00 | 0.00 | 0.00 | 2264.65 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 55.80 |
| **Total** | **670280.24** | **95.97** | **67183.13** | **97329.36** | **505657.73** | **14.05** | **0.00** | **323.49** | **0.00** | **0.00** | **0.00** | **9.20** | **772.61** |

Note:
-357.93 tonnes and 51.73 tonnes of inert C&D material were disposed of as public fill to Tseung Kwan O Area 137 Public Fill and Tuen Mun Area 38 respectively in the reporting month.

# J. Environmental Mitigation Measures – Implementation Status

**Table J-1: Environmental Mitigation Measures Implementation Status (April 2024)**

| EM&A Ref. | Recommendation Measures | Implementation Stage<br>Zone 2B & 2C |
|---|---|---|
| **Air Quality Impact (Construction)** | | |
| 2.1 | **General Dust Control Measures**<br>Frequent water spraying for active construction areas (12 times a day or once every one hour), including Heavy construction activities such as construction of buildings or roads, drilling, ground excavation, cut and fill operations (i.e., earth moving) | ✓ |
| 2.1 | **Best Practice for Dust Control**<br>The relevant best practices for dust control as stipulated in the Air Pollution Control (construction Dust) Regulation should be adopted to further reduce the construction dust impacts from the Project. These best practices include: | |
| | *Good Site Management* | ✓ |
| | • Good site management is important to help reducing potential air quality impact down to an acceptable level. As a general guide, the Contractor should maintain high standard of housekeeping to prevent emission of fugitive dust. Loading, unloading, handling and storage of raw materials, wastes or by-products should be carried out in a manner so as to minimise the release of visible dust emission. Any piles of materials accumulated on or around the work areas should be cleaned up regularly. Cleaning, repair and maintenance of all plant facilities within the work areas should be carried out in a manner minimising generation of fugitive dust emissions. The material should be handled properly to prevent fugitive dust emission before cleaning. | |
| | *Disturbed Parts of the Roads* | ✓ |
| | • Each and every main temporary access should be paved with concrete, bituminous hardcore materials or metal plates and kept clear of dusty materials; or | |
| | • Unpaved parts of the road should be sprayed with water or a dust suppression chemical so as to keep the entire road surface wet. | Obs |
| | *Exposed Earth* | N/A |
| | • Exposed earth should be properly treated by compaction, hydroseeding, vegetation planting or seating with latex, vinyl, bitumen within six months after the last construction | No exposed earth in this project. |

| EM&A Ref. | Recommendation Measures | Implementation Stage<br>Zone 2B & 2C |
|---|---|---|
| | activity on the site or part of the site where the exposed earth lies. | |
| | *Loading, Unloading or Transfer of Dusty Materials* | ✓ |
| | • All dusty materials should be sprayed with water immediately prior to any loading or transfer operation so as to keep the dusty material wet. | |
| | *Debris Handling* | ✓ |
| | • Any debris should be covered entirely by impervious sheeting or stored in a debris collection area sheltered on the top and the three sides. | |
| | • Before debris is dumped into a chute, water should be sprayed so that it remains wet when it is dumped. | N/A<br>No debris chute on-site |
| | *Transport of Dusty Materials* | ✓ |
| | • Vehicle used for transporting dusty materials/spoils should be covered with tarpaulin or similar material. The cover should extend over the edges of the sides and tailboards. | |
| | *Wheel washing* | ✓ |
| | • Vehicle wheel washing facilities should be provided at each construction site exit. Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels. | |
| | *Use of vehicles* | ✓ |
| | • The speed of the trucks within the site should be controlled to about 10km/hour in order to reduce adverse dust impacts and secure the safe movement around the site. | |
| | • Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels. | ✓ |
| | • Where a vehicle leaving the construction site is carrying a load of dusty materials, the load should be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle. | ✓ |
| | *Site hoarding* | ✓ |
| | • Where a site boundary adjoins a road, street, service lane or other area accessible to the public, hoarding of not less than 2.4m high from ground level should be provided along the entire length of that portion of the site boundary except for a site entrance or exit. | |

| EM&A Ref. | Recommendation Measures | Implementation Stage<br>Zone 2B & 2C |
|---|---|---|
| 2.1 | **Best Practicable Means for Cement Works (Concrete Batching Plant)**<br>The relevant best practices for dust control as stipulated in the Guidance Note on the Best Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2(93) should be followed and implemented to further reduce the construction dust impacts of the Project. These best practices include: | |
| | *Exhaust from Dust Arrestment Plant* | N/A |
| | • Wherever possible the final discharge point from particulate matter arrestment plant, where is not necessary to achieve dispersion from residual pollutants, should be at low level to minimise the effect on the local community in the case of abnormal emissions and to facilitate maintenance and inspection | No concrete batching plant in in this project. |
| | *Emission Limits* | N/A |
| | • All emissions to air, other than steam or water vapour, shall be colourless and free from persistent mist or smoke | No concrete batching plant in in this project. |
| | *Engineering Design/Technical Requirements* | N/A |
| | • As a general guidance, the loading, unloading, handling and storage of fuel, raw materials, products, wastes or by-products should be carried out in a manner so as to prevent the release of visible dust and/or other noxious or offensive emissions | No concrete batching plant in this project. |
| | **Non-Road Mobile Machinery (NRMM):**<br>All NRMMs operating on-site which are subject to emission control of Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation are approved/exempted (as the case may be) and affixed with the requisite approval/exemption labels. | ✓ |
| **Noise Impact (Construction)** | | |

| EM&A Ref. | Recommendation Measures | Implementation Stage<br>Zone 2B & 2C |
|---|---|---|
| 3.1 | **Good Site Practice**<br>Good site practice and noise management can significantly reduce the impact of construction site activities on nearby NSRs. The following package of measures should be followed during each phase of construction: | |
| | • only well-maintained plant to be operated on-site and plant should be serviced regularly during the construction works; | ✓ |
| | • machines and plant that may be in intermittent use to be shut down between work periods or should be throttled down to a minimum | ✓ |
| | • plant known to emit noise strongly in one direction, should, where possible, be orientated to direct noise away from the NSRs; | ✓ |
| | • mobile plant should be sited as far away from NSRs as possible; and | ✓ |
| | • material stockpiles and other structures to be effectively utilised, where practicable, to screen noise from on-site construction activities. | ✓ |
| 3.1 | **Adoption of Quieter PME**<br>The recommended quieter PME adopted in the assessment were taken from the EPD's QPME Inventory and "*Sound Power Levels of Other Commonly Used PME*" are presented in **Table 4.26** in the EIA report. It should be noted that the silenced PME selected for assessment can be found in Hong Kong. | ✓ |
| 3.1 | **Use of Movable Noise Barriers**<br>Movable noise barriers can be very effective in screening noise from particular items of plant when constructing the Project. Noise barriers located along the active works area close to the noise generating component of a PME could produce at least 10 dB(A) screening for stationary | ✓ |

| EM&A Ref. | Recommendation Measures | Implementation Stage<br>Zone 2B & 2C |
|---|---|---|
| | plant and 5 dB(A) for mobile plant provided the direct line of sight between the PME and the NSRs is blocked. | |
| 3.1 | **Use of Noise Enclosure/ Acoustic Shed**<br>The use of noise enclosure or acoustic shed is to cover stationary PME such as air compressor and concrete pump. With the adoption of the noise enclosure, the PME could be completely screened, and noise reduction of 15 dB(A) can be achieved according to the EIAO Guidance Note No. 9/2010. | ✓ |
| 3.1 | **Use of Noise Insulating Fabric**<br>Noise insulating fabric can also be adopted for certain PME (e.g. drill rig, pilling machine etc). The fabric should be lapped such that there are no openings or gaps on the joints. According to the approved Tsim Sha Tsui Station Northern Subway EIA report (AEIAR-127/2008), a noise reduction of 10 dB(A) can be achieved for the PME lapped with the noise insulating fabric. | ✓ |
| 3.1 | **Scheduling of Construction Works outside School Examination Periods**<br>During construction phase, the contractor should liaise with the educational institutions (including NSRs LCS and CRGPS) to obtain the examination schedule and avoid the noisy construction activities during school examination periods. | ✓ |
| **Water Quality Impact (Construction)** | | |
| 4.1 | **Construction site runoff and drainage**<br>The site practices outlined in ProPECC Note PN 1/94 should be followed as far as practicable in order to minimise surface runoff and the chance of erosion. The following measures are recommended to protect water quality and sensitive uses of the coastal area, and when properly implemented should be sufficient to adequately control site discharges so as to avoid water | |

| EM&A Ref. | Recommendation Measures | Implementation Stage<br>Zone 2B & 2C |
|---|---|---|
| | quality impacts: | |
| | • At the start of site establishment, perimeter cut-off drains to direct off-site water around the site should be constructed with internal drainage works and erosion and sedimentation control facilities implemented. Channels, earth bunds or sand bag barriers should be provided on site to direct storm water to silt removal facilities. The design of the temporary on-site drainage system should be undertaken by the WKCDA's Contractor prior to the commencement of construction; | ✓ |
| | • Sand/silt removal facilities such as sand/silt traps and sediment basins should be provided to remove sand/silt particles from runoff to meet the requirements of the TM standards under the WPCO. The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC Note PN 1/94. Sizes may vary depending upon the flow rate. The detailed design of the sand/silt traps should be undertaken by the WKCDA's Contractor prior to the commencement of construction. | ✓ |
| | • All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly during rainstorms. Deposited silt and grit should be regularly removed, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times. | ✓ |
| | • Measures should be taken to minimize the ingress of site drainage into excavations. If excavation of trenches in wet periods is necessary, they should be dug and backfilled in short sections wherever practicable. Water pumped out from foundation excavations should be discharged into storm drains via silt removal facilities. | ✓ |
| | • All vehicles and plant should be cleaned before leaving a construction site to ensure no | ✓ |

| EM&A Ref. | Recommendation Measures | Implementation Stage<br>Zone 2B & 2C |
|---|---|---|
| | earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facility should be provided at construction site exit where practicable. Wash-water should have sand and silt settled out and removed regularly to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains. | |
| | • Open stockpiles of construction materials or construction wastes onsite should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system. | ✓ |
| | • Manholes (including newly constructed ones) should be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and stormwater runoff being directed into foul sewers. | ✓ |
| | • Precautions should be taken at any time of the year when rainstorms are likely. Actions should be taken when a rainstorm is imminent or forecasted and actions to be taken during or after rainstorms are summarized in Appendix A2 of ProPECC Note PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes. | ✓ |
| | • Bentonite slurries used in piling or slurry walling should be reconditioned and reused wherever practicable. Temporary enclosed storage locations should be provided on-site for any unused bentonite that needs to be transported away after all the related construction activities are completed. The requirements in ProPECC Note PN 1/94 should be adhered to in the handling and disposal of bentonite slurries. | N/A<br>No bentonite slurries are used in this project. |

| EM&A Ref. | Recommendation Measures | Implementation Stage<br>Zone 2B & 2C |
|---|---|---|
| 4.1 | **Barging facilities and activities**<br>Recommendations for good site practices during operation of the proposed barging point include: | |
| | • All vessels should be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; | N/A<br>No barging facilities in this project at this stage. |
| | • Loading of barges and hoppers should be controlled to prevent splashing of material into the surrounding water. Barges or hoppers should not be filled to a level that will cause the overflow of materials or polluted water during loading or transportation; | N/A<br>No barging facilities in this project at this stage. |
| | • All hopper barges should be fitted with tight fitting seals to their bottom openings to prevent leakage of material; and | N/A<br>No barging facilities in this project at this stage. |
| | • Construction activities should not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site. | N/A<br>No barging facilities in this project at this stage. |
| 4.1 | **Sewage effluent from construction workforce**<br>Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site where necessary to handle sewage from the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance. | ✓ |
| 4.1 | **General construction activities** | |
| | • Construction solid waste, debris and refuse generated on-site should be collected, handled and disposed of properly to avoid entering any nearby storm water drain. Stockpiles of cement and other construction materials should be kept covered when not | ✓ |

| EM&A Ref. | Recommendation Measures | Implementation Stage<br>Zone 2B & 2C |
|---|---|---|
| | being used. | |
| | • Oils and fuels should only be stored in designated areas which have pollution prevention facilities. To prevent spillage of fuels and solvents to any nearby storm water drain, all fuel tanks and storage areas should be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. The bund should be drained of rainwater after a rain event. | ✓ |
| **Waste Management Implications (Construction)** | | |
| 6.1 | **Good Site Practices**<br>Recommendations for good site practices during the construction activities include: | |
| | • Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site | ✓ |
| | • Training of site personnel in proper waste management and chemical handling procedures | ✓ |
| | • Provision of sufficient waste disposal points and regular collection of waste | ✓ |
| | • Appropriate measures to minimise windblown litter and dust/odour during transportation of waste by either covering trucks or by transporting wastes in enclosed containers | ✓ |
| | • Provision of wheel washing facilities before the trucks leaving the works area so as to minimise dust introduction to public roads | ✓ |
| | • Well planned delivery programme for offsite disposal such that adverse environmental impact from transporting the inert or non-inert C&D materials is not anticipated | ✓ |
| 6.1 | **Waste Reduction Measures**<br>Recommendations to achieve waste reduction include: | |

| EM&A Ref. | Recommendation Measures | Implementation Stage<br>Zone 2B & 2C |
|---|---|---|
| | • Sort inert C&D material to recover any recyclable portions such as metals | ✓ |
| | • Segregation and storage of different types of waste in different containers or skips to enhance reuse or recycling of materials and their proper disposal | ✓ |
| | • Encourage collection of recyclable waste such as waste paper and aluminium cans by providing separate labelled bins to enable such waste to be segregated from other general refuse generated by the work force | ✓ |
| | • Proper site practices to minimise the potential for damage or contamination of inert C&D materials | ✓ |
| | • Plan the use of construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of wastes | ✓ |
| 6.1 | **Inert and Non-inert C&D Materials**<br>In order to minimise impacts resulting from collection and transportation of inert C&D material for off-site disposal, the excavated materials should be reused on-site as fill material as far as practicable. In addition, inert C&D material generated from excavation works could be reused as fill materials in local projects that require public fill for reclamation. | |
| | • The surplus inert C&D material will be disposed of at the Government's PFRFs for beneficial use by other projects in Hong Kong. | ✓ |
| | • Liaison with the CEDD Public Fill Committee (PFC) on the allocation of space for disposal of the inert C&D materials at PFRF is underway. No construction work is allowed to proceed until all issues on management of inert C&D materials have been resolved and all relevant arrangements have been endorsed by the relevant authorities including PFC and EPD. | ✓ |
| | • The C&D materials generated from general site clearance should be sorted on site to | ✓ |

| EM&A Ref. | Recommendation Measures | Implementation Stage<br>Zone 2B & 2C |
|---|---|---|
| | segregate any inert materials for reuse or disposal of at PFRFs whereas the non-inert materials will be disposed of at the designated landfill site. | |
| | • In order to monitor the disposal of inert and non-inert C&D materials at respectively PFRFs and the designated landfill site, and to control fly-tipping, it is recommended that the Contractor should follow the Technical Circular (Works) No. 6/2010 for Trip Ticket System for Disposal of Construction & Demolition Materials issued by Development Bureau. In addition, it is also recommended that the Contractor should prepare and implement a Waste Management Plan detailing their various waste arising and waste management practices in accordance with the relevant requirements of the Technical Circular (Works) No. 19/2005 Environmental Management on Construction Site. | ✓ |
| 6.1 | **Chemical Waste** | |
| | • If chemical wastes are produced at the construction site, the Contractor will be required to register with the EPD as a chemical waste producer and to follow the guidelines stated in the "Code of Practice on the Packaging Labelling and Storage of Chemical Wastes". Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor should use a licensed collector to transport and dispose of the chemical wastes at the approved Chemical Waste Treatment Centre or other licensed recycling facilities, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation. | ✓ |
| | • Potential environmental impacts arising from the handling activities (including storage, | ✓ |

| EM&A Ref. | Recommendation Measures | Implementation Stage<br>Zone 2B & 2C |
|---|---|---|
| | collection, transportation and disposal of chemical waste) are expected to be minimal with the implementation of appropriate mitigation measures as recommended. | |
| 6.1 | **General Refuse**<br>General refuse should be stored in enclosed bins or compaction units separated from inert C&D materials. A reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from inert C&D materials. Preferably an enclosed and covered area should be provided to reduce the occurrence of 'wind blown' light material. | ✓ |
| **Land Contamination (Construction)** | | |
| 7.1 | The potential for land contamination issues at the TST Fire Station due to its future relocation will be confirmed by site investigation after land acquisition. Where necessary, mitigation measures for minimising potential exposure to contaminated materials (if any) or remediation measures will be identified. If contaminated land is identified (e.g., during decommissioning of fuel oil storage tanks) after the commencement of works, mitigation measures are proposed in order to minimise the potentially adverse effects on the health and safety of construction workers and impacts arising from the disposal of potentially contaminated materials. The following measures are proposed for excavation and transportation of contaminated material: | |
| | • To minimize the chance for construction workers to come into contact with any contaminated materials, bulk earth-moving excavation equipment should be employed; | N/A<br>TST Fire Station is out of this project boundary, no mitigation measure is required. |
| | • Contact with contaminated materials can be minimised by wearing appropriate clothing and personal protective equipment such as gloves and masks (especially when interacting directly with contaminated material), provision of washing facilities and prohibition of | N/A<br>TST Fire Station is out of this project boundary, no mitigation measure is required. |

| EM&A Ref. | Recommendation Measures | Implementation Stage<br>Zone 2B & 2C |
|---|---|---|
| | smoking and eating on site; | |
| | • Stockpiling of contaminated excavated materials on site should be avoided as far as possible; | N/A<br>TST Fire Station is out of this project boundary, no mitigation measure is required. |
| | • The use of contaminated soil for landscaping purpose should be avoided unless pre-treatment was carried out; | N/A<br>TST Fire Station is out of this project boundary, no mitigation measure is required. |
| | • Vehicles containing any contaminated excavated materials should be suitably covered to reduce dust emissions and/or release of contaminated wastewater; | N/A<br>TST Fire Station is out of this project boundary, no mitigation measure is required. |
| | • Truck bodies and tailgates should be sealed to stop any discharge; | N/A<br>TST Fire Station is out of this project boundary, no mitigation measure is required. |
| | • Only licensed waste haulers should be used to collect and transport contaminated material to treatment/disposal site and should be equipped with tracking system to avoid fly tipping; | N/A<br>TST Fire Station is out of this project boundary, no mitigation measure is required. |
| | • Speed control for trucks carrying contaminated materials should be exercised; | N/A<br>TST Fire Station is out of this project boundary, no mitigation measure is required. |
| | • Observe all relevant regulations in relation to waste handling, such as Waste Disposal Ordinance (Cap. 354), Waste Disposal (Chemical Waste) (General) Regulation (Cap. 354) and obtain all necessary permits where required; and | N/A<br>TST Fire Station is out of this project boundary, no mitigation measure is required. |
| | • Maintain records of waste generation and disposal quantities and disposal arrangements. | N/A |

| EM&A Ref. | Recommendation Measures | Implementation Stage<br>Zone 2B & 2C |
|---|---|---|
| | | TST Fire Station is out of this project boundary, no mitigation measure is required. |
| **Ecological Impact (Construction)** | | |
| | No mitigation measure is required. | |
| **Landscape and Visual Impact (Construction)** | | |
| Table 9.1 (CM1) | Trees should be retained in situ on site as far as possible. Should tree removal be unavoidable due to construction impacts, trees will be transplanted or felled with reference to the stated criteria in the Tree Removal Applications to be submitted to relevant government departments for approval in accordance to ETWB TCW No. 29/2004 and 3/2006. | ✓ |
| Table 9.1 (CM2) | Compensatory tree planting shall be incorporated to the proposed project and maximize the new tree, shrubs and other vegetation planting to compensate tree felled and vegetation removed. Also, implementation of compensatory planting should be of a ratio not less than 1:1 in terms of quality and quantity within the site. | N/A<br>Compensatory tree planting is being reviewed. |
| Table 9.1 (CM3) | Buffer trees for screening purposes to soften the hard architectural and engineering structures and facilities. | N/A<br>Roof garden is designed to be built, but it has not been completed yet. |
| Table 9.1 (CM4) | Softscape treatments such as vertical green wall panel /planting of climbing and/or weeping plants, etc, to maximize the green coverage and soften the hard architectural and engineering structures and facilities. | N/A<br>Climbing or weeping plants are designed to be planted, but proposal is being reviewed for the planting location. |
| Table 9.1 (CM5) | Roof greening by means of intensive and extensive green roof to maximize the green coverage and improve aesthetic appeal and visual quality of the building/structure. | N/A<br>Roof garden is designed to be built, but it has not been completed yet. |

| EM&A Ref. | Recommendation Measures | Implementation Stage<br>Zone 2B & 2C |
|---|---|---|
| Table 9.1 (CM6) | Sensitive streetscape design should be incorporated along all new roads and streets. | N/A<br>Greening along the seafront is proposed, and under review. |
| Table 9.1 (CM7) | Structure, ornamental planting shall be provided along amenity strips to enhance the landscape quality. | N/A<br>Gardens are designed to be built, and under review. |
| Table 9.1 (CM8) | Landscape design shall be incorporated to architectural and engineering structures in order to provide aesthetically pleasing designs. | N/A<br>Roof garden is designed to be built, and under review. |
| Table 9.1 (CM9) | Minimize the structure of marine facilities to be built on the seabed and foreshore in order to minimize the affected extent to the waterbody | N/A<br>No marine facilities for this project. |
| Table 9.2 (MCP1) | Use of decorative screen hoarding/boards | ✓ |
| Table 9.2 (MCP2) | Early introduction of landscape treatments | N/A<br>No landscape treatments during this stage. |
| Table 9.2 (MCP3) | Adoption of light colour for the temporary ventilation shafts for the basement during the transition period. | N/A<br>No ventilation shafts for this project. |
| Table 9.2 (MCP4) | Control of night time lighting | ✓ |
| Table 9.2 (MCP5) | Use of greenery such as grass cover for the temporary open areas will help achieve the visual balance and soften the hard edges of the structures. | N/A<br>No temporary open areas for this project. |

N/A - Not Applicable
✓ - Implemented
Obs - Observed
Rem - Reminder

# K. Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions

Cumulative statistics for complaints, notifications of summons and successful prosecutions for the Project account for period starting from the date of commencement of construction work to the end of the reporting month are summarised in the Table K-1 below.

**Table K-1: Statistics for complaints, notifications of summons and successful prosecutions for Zone 2B & 2C**

| Reporting Period | Cumulative Statistics | | |
|---|---|---|---|
| | **Complaints** | **Notifications of summons** | **Successful prosecutions** |
| This reporting month (April 2024) | 0 | 0 | 0 |
| From 30 September 2021 to end of the reporting month | 31 | 0 | 0 |

# END OF THE REPORT